



**The role of Strategic Environmental Assessment in the  
achievement of Sustainable Development Goals within  
business strategies and entrepreneurial initiatives**

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Entrepreneurship**

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# Abstract

Based on the role of Strategic Environmental Assessment (SEA) in the achievement of Sustainable Development Goals (SDG)s within business strategies and entrepreneurial initiatives, this research work is established to study and investigate a topic of interest to Management of Innovation and Entrepreneurship. According to Partidário, SEA is a public policy instrument mandated by law for certain categories of strategic initiatives, but it can also be used voluntarily to stimulate innovative practices, particularly if and when, adopting SEA with a strategic thinking approach (Strategic Thinking for Sustainability (ST4S) methodology). This research aimed to review how industries/businesses are thriving in their pathways to sustainability and to explore how SEA can be helpful in that endeavour. Summing, the end-result of exploring the strategicness potential of SEA in assisting decision-makers to reach their long-term and complex objectives was successfully fulfilled. Moreover, by sending questionnaires to experts and consultants, and by adopting companies' business plans and strategic reports as case-studies, it was found that those objectives address the SDGs, as supported by recent literature and other sustainability assessment instruments such as the European Union (EU) Sustainable Taxonomy and the Environmental, Social and Governance (ESG) Criteria and Scores. It showed that strategic thinking approaches to SEA are used by private initiatives to attain Sustainable Development Goals through the consideration of critical decision factors: governance of sustainability practices within the private initiatives' organizational chart; education of internal employees and external agents on sustainable issues; and economic prosperity combined with environmental and social protection, among others.

## Keywords

Strategic Environmental Assessment (SEA); Sustainable Development Goals (SDGs); Strategic Thinking; Business Strategies; Entrepreneurial Initiatives; Decision-Making.



# Resumo

Baseado no papel da Avaliação Ambiental Estratégica (AAE) na obtenção dos Objetivos de Desenvolvimento Sustentável (ODS)s ao nível das iniciativas privadas, esta dissertação procura estudar e investigar um tópico de interesse para Gestão de Inovação e Empreendedorismo. De acordo com Partidário, AAE é um instrumento público mandatado por lei para determinadas categorias de iniciativas estratégicas, mas pode ser utilizado voluntariamente para estimular práticas inovadoras, particularmente se e quando, AAE é adotada segundo uma metodologia de pensamento estratégico (ST4S). Este trabalho procura rever como indústrias/negócios prosperam na criação de planos sustentáveis e como AAE pode abrir caminho nos mesmos. Resumindo, o objetivo final de explorar o potencial estratégico da AAE no apoio aos decisores para atingirem os seus objetivos complexos e de longo-prazo foi alcançado com sucesso. Para além disso, com o envio de questionários a consultores, e a adoção de planos e relatórios estratégicos de iniciativas privadas como casos de estudo, foi confirmado que estes objetivos abordam os ODSs, tal como é apoiado por literatura recente e outros instrumentos de avaliação de sustentabilidade como a Taxonomia Sustentável da UE e os critérios de ESG. A investigação mostrou que as abordagens estratégicas da AAE são usadas por iniciativas privadas para atingir os Objetivos de Desenvolvimento Sustentável através da consideração dos seguintes fatores críticos de decisão: organogramas das iniciativas privadas incluem práticas de sustentabilidade; educação e motivação dos colaboradores e do público em geral relativamente a sustentabilidade; e prosperidade económica combinada com proteção ambiental e social, entre outros.

## Palavras Chave

Avaliação Ambiental Estratégica (AAE); Objetivos de Desenvolvimento Sustentável (ODSs); Pensamento Estratégico; Estratégias Empresariais; Iniciativas Empreendedoras; Tomada de Decisão.





# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Motivation, Objectives and Organization of this Dissertation . . . . .	5
<b>2</b>	<b>Literature Review</b>	<b>7</b>
2.1	Historical contextualization of the Traditional and Strategic Thinking Approaches to the Strategic Environmental Assessment Instrument . . . . .	9
2.1.1	ST4S Approach to Strategic Environmental Assessment Application within Business Strategies and Entrepreneurial Initiatives . . . . .	15
2.2	Sustainable Development Goals contextualization and its connection to Strategic Environmental Assessment and Private Initiatives . . . . .	21
2.3	Linking Sustainability Assessment, ESG Criteria and EU Sustainable Taxonomy with Strategic Environmental Assessment and Sustainable Development Goals . . . . .	26
<b>3</b>	<b>Methodology</b>	<b>33</b>
3.1	Questionnaire . . . . .	36
3.2	Case-Studies . . . . .	37
3.2.1	Redes Energéticas Nacionais (REN) . . . . .	39
3.2.2	Galp Energia . . . . .	40
3.2.3	Shell PLC . . . . .	40
3.2.4	Hydro-Québec . . . . .	41
<b>4</b>	<b>Results &amp; Discussion</b>	<b>43</b>
4.1	Questionnaire . . . . .	45
4.2	Case-Studies . . . . .	52
4.2.1	Redes Energéticas Nacionais (REN) . . . . .	52
4.2.2	Galp Energia . . . . .	54
4.2.3	Shell PLC . . . . .	57
4.2.4	Hydro-Québec . . . . .	59
4.3	Discussion . . . . .	62

<b>5</b>	<b>Conclusions, Limitations &amp; Future Work</b>	<b>69</b>
5.1	Conclusions . . . . .	71
5.2	Limitations and Future Work . . . . .	72
	<b>Bibliography</b>	<b>75</b>
<b>A</b>	<b>Questionnaire</b>	<b>81</b>
A.1	Instituto Superior Técnico Master's Dissertation - Strategic Environmental Assessment (SEA) for Entrepreneurial/Private Initiatives . . . . .	81
A.1.1	Participation Disclaimer . . . . .	82
A.1.2	Sample Characterisation . . . . .	82
A.1.3	Companies . . . . .	82
A.1.4	Start-ups . . . . .	85
A.1.5	Out of Sample . . . . .	88
A.1.6	Demographic data . . . . .	90
A.1.7	Thank you for the participation! . . . . .	91
<b>B</b>	<b>Additional Tables</b>	<b>93</b>

# List of Figures

1.1	Contextualization of the Research Objective, Questions and Hypothesis . . . . .	6
2.1	SEA Approaches (source: [1]) . . . . .	10
2.2	Tiering of Decision-Making Subjects of Application (source: [2]) . . . . .	11
2.3	ST4S contextualization (source: [1]) . . . . .	16
2.4	Phases of the Strategic Thinking Approach for SEA (source: [3]) . . . . .	18
2.5	ST4S Approach for SEA Road-map (source: [3]) . . . . .	20
2.6	SDGs - Sustainable Development Goals (source: [4]) . . . . .	23
2.7	Relationship between SEA & the SDGs (source: [5]) . . . . .	24
2.8	EU Sustainable Taxonomy Scope (source: [6]) . . . . .	31
3.1	GHG Emission Estimates – Power Generation Options Based on Life-cycle Analysis (gCO2 eq./kWh) (source: [7]) . . . . .	42
4.1	How familiar are you and your company with the Strategic Environmental Assessment (SEA) instrument? . . . . .	46
4.2	How familiar are you and your team with the Strategic Environmental Assessment (SEA) instrument? . . . . .	50
4.3	Are you aware of the possibilities to apply these instruments? . . . . .	51
4.4	Galp's Sustainable Development Goals Business Strategies (source: [8]) . . . . .	55
4.5	Galp's HSSE Requirements (source: [8]) . . . . .	56
4.6	Galp's Consultation Strategy (source: [8]) . . . . .	57
4.7	SDGs explicitly addressed by Shell (source: [9]) . . . . .	57
4.8	Shell's ESG Ratings (source: [10]) . . . . .	59
4.9	The three pillars of Governance, Community and Environment (source: [11]) . . . . .	61
4.10	SDGs and Agenda 2030 reportedly addressed by Hydro-Québec (source: [12]) . . . . .	63



# List of Tables

B.1	ST4S approach to SEA and differences to the traditional approaches (source: [1]) . . . .	94
B.2	REN's act4Nature commitments and monitoring indicators (source: [13]) . . . . .	94
B.3	REN's act4Nature commitments and monitoring indicators (continuation) (source: [13]) . .	95
B.4	Fundação's Galp targets for Agenda 2030 (source: [8]) . . . . .	95
B.5	Galp's Strategy to Attain the SDGs (source: [8]) . . . . .	96
B.6	Shell's Environmental Performance Data (source: [9]) . . . . .	97
B.7	Shell's Social Performance Data (source: [9]) . . . . .	98
B.8	Sustainable Development Plan 2020-2024 - 12 Strategies (source: [14]) . . . . .	99
B.9	Sustainable Development Plan 2020-2024 - 12 Strategies (continuation) (source: [14]) . .	99



# Acronyms

<b>AAE</b>	Avaliação Ambiental Estratégica
<b>AI</b>	Artificial Intelligence
<b>APA</b>	Agência Portuguesa do Ambiente
<b>CDF</b>	Critical Decision Factors
<b>CEO</b>	Chief Executive Officer
<b>CSR</b>	Corporate Social Responsibility
<b>EFSI</b>	European Fund for Strategic Investments
<b>EIA</b>	Environmental Impact Assessment
<b>ESG</b>	Environmental, Social and Governance
<b>ESI</b>	Environmental and Sustainability Issues
<b>EU</b>	European Union
<b>GRI</b>	Global Reporting Initiative
<b>GSDS</b>	Government Sustainable Development Strategy
<b>HSSE</b>	Health, Safety, Social and Environment
<b>IAIA</b>	International Association for Impact Assessment
<b>ISO</b>	International Organization for Standardization
<b>IST</b>	Instituto Superior Técnico
<b>IT</b>	Information Technology
<b>IUCN</b>	International Union for Conservation of Nature
<b>KPI</b>	Key Performance Indicators
<b>LCA</b>	Life-Cycle Analysis
<b>MDG</b>	Millennium Development Goals

<b>NGO</b>	Non-Governmental Organizations
<b>ODS</b>	Objetivos de Desenvolvimento Sustentável
<b>OHS</b>	Occupational Health and Safety
<b>PLC</b>	Public Limited Company
<b>PPP</b>	policies, plans and programmes
<b>REN</b>	Redes Energéticas Nacionais
<b>RNT</b>	Rede Nacional de Transporte
<b>RNTGN</b>	Rede Nacional de Transporte de Gás Natural
<b>ROI</b>	Return on Investment
<b>SA</b>	Sustainability Assessment
<b>SBU</b>	Strategic Business Units
<b>SDG</b>	Sustainable Development Goals
<b>SEA</b>	Strategic Environmental Assessment
<b>SESCo</b>	Safety, Environment and Sustainability Committee
<b>SI</b>	Strategic Issues
<b>SRF</b>	Strategic Reference Framework
<b>SRI</b>	Socially Responsible Investment
<b>ST4S</b>	Strategic Thinking for Sustainability
<b>SWOT</b>	Strengths, Weaknesses, Opportunities and Threats
<b>UN</b>	The United Nations
<b>UNECE</b>	United Nations Economic Commission for Europe
<b>TEG</b>	Technical Expert Group
<b>TCFD</b>	Task-force on Climate-related Financial Disclosures
<b>TNFD</b>	Task-force for Nature-related Financial Disclosures



# 1

## Introduction

### Contents

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1.1 Motivation, Objectives and Organization of this Dissertation . . . . .	5
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Strategic Environmental Assessment (SEA) was introduced as a concept in 1989 [15]. It is defined as a systematic instrument to aid, as early as possible, in the decision-making, planning and development processes of projects and policies, plans and programmes (PPP)s [16]; [1]; [17]. This instrument's main objective is to promote sustainable development [1]. Researchers admit that, depending on the intended outcomes of each SEA application, it can be addressed in various ways [1]. Based on the cultural and governmental context, SEA may be used solely for the evaluation of environmental and social impacts, also called effects-based SEA [1]. This represents the most usual approach to SEA that focuses on delivering knowledgeable plans of action to the development of the projects and PPPs [1]. The environmental report, which is the outcome of this process, advises on practices to mitigate negative effects and monitor positive contributions to sustainability [1].

From 2001 onwards, the European Directive 2001/42/EC, established minimum conditions to guarantee legal compliance to environmental and social protection, without directly intervening with both traditional and strategic approaches of the SEA best practices framework [3]. A protocol signed by member states of the United Nations Economic Commission for Europe (UNECE) in Kiev in 2003, expanded the coverage of the Espoo Convention on Environmental Impact Assessment in a Transboundary Context, signed in 1991 and put in practice in 1997 [18] [19] [20]. Complex SEA applications are highly comprehensive and their challenges are temporal and geographically extensible [21]; [3]. In Europe, member states structure their SEA according to the European Union (EU) SEA Directive stated above and that applies to public projects and PPPs of the primary (agriculture, forestry, fisheries), secondary (energy, industry) and tertiary (transport, waste management, water management, telecommunications, tourism) sectors of activity [22]; [23]. UNECE state that this directive is mandatory to authorities at national, regional and local level, without explicitly subscribing private initiatives to it [18]. These led to a diffusion of the SEA process through other countries beyond the EU [19] [20]. The growing formal and informal application of this instrument is widely recognized and appreciated internationally, as noticed in the large amounts of literature about this subject [24]; [25].

However, there is another approach to SEA that will be highlighted in this dissertation. A deep dive in the Strategic Thinking for Sustainability (ST4S) approach to SEA, will allow to transfer this instrument from public sector domain to private sector business strategies. This variance of the SEA process was thought by Partidário in the late 1990s to embrace complexity and uncertainty common to business and entrepreneurial initiatives [1]. Its formulation was founded in systems theories and sustainability transitions theory (discussed deeply in Chapter 2) [1]. This iterative approach sets up strategic options to prioritize the long-term outputs of a project or PPP, integrating the opinions and feedback of the public and all the stakeholders that collaborate in the decision-making, planning and development processes [1]; [15]; [26].

A practical example of application of the ST4S approach to SEA within business strategies, in Por-

tugal, were the Investment and Development Plans of Rede Nacional de Transporte - RNT and Rede Nacional de Transporte de Gás Natural - RNTGN. These extensive reports, written alongside universities and experienced researchers in the topic, show step by step the adequate application of a strategic SEA process [13]. Moreover, the development of Redes Energéticas Nacionais (REN)'s Best Practice Guide, with support of Agência Portuguesa do Ambiente (APA), denote the unequivocal evidence of the role that SEA plays for REN's business strategies to achieve sustainable development [3]. These examples are also based in the Article 3 of Decree-Law 232/2007, 5th of June, that was modified by the Decree-Law 58/2011, 4th of May, which established the European Directive 2001/42/EC guidelines to national regulations [3]; [26]. Furthermore, ST4S approach to SEA can be interpreted differently across geographies [3].

Strategic approaches are believed to assist in the attainment of the Sustainable Development Goals (SDG)s, by fostering innovative solutions to the environmental, social, institutional, political and economical persistent concerns [1]. The linear and traditional thinking of SEA only as a plan (priorities, options and measures for resource allocation), programme (organized agenda with specification of activities) or policy (implementation road-map with defined objectives, rules and mechanisms) does not address the broad complexity of the SDGs [27]. It limits its overall strategicness capacity to solve ongoing and complex global issues, because it does not account for the enlarged systems of agents and planning processes that were not predicted in the conventional formulation of the SEA process [1].

The Sustainable Development Goals, that were mentioned in the previous paragraph, are going to be the juries of the role that the ST4S, and other strategic approaches to SEA, have in achieving sustainable pathways within companies and start-ups [1]. There are a total of 17 Goals under the 2030 Agenda for Sustainable Development, including, no hunger, zero poverty, gender equality and climate change (more detail in the Chapter 2). This cluster of environmental and social objectives, accepted by The United Nations (UN) state members, triggers governments, private organizations and entrepreneurial initiatives to be aware of the sustainability consequences brought by projects and PPPs endured within their enterprises [5]. Moreover, they represent a tangible manner to measure implementation gaps between the project's capacities and its actual planning and development processes related to sustainability [28]; [19]; [5].

To sum up, the proposed role of the ST4S process, to attain the SDGs through a strategic and systematic approach, is to define action plans that accommodate biophysical, social, institutional and economical dimensions, building rationales for sustainable development [3]; [1].

## 1.1 Motivation, Objectives and Organization of this Dissertation

For me, this dissertation is relevant because of the urgency to fight complex and uncertain environmental and social issues that spawn everyday. As they relate to all humankind and natural ecosystems, this issues should be handled as social constructs, built on top of interactions and participation of, respectively, any system and/or person [1].

New generations are taught to be more responsible, and the corporate world is also trying to be more proactive in embracing sustainable practices, as shown in the creation of new sustainability governance departments within private organizations' architectures. These are responsible to follow SEA best practices, guidelines and recommendations, and evaluate other sustainability assessment frameworks before investing in a new project or PPP. Still, these intentions are not empowered enough, as the new and older employees from each company lack support from leadership, since it might involve financial investments or transformational changes in the company's ways of working. Until this moment, literature does not give sufficient evidence on how to apply correct methodologies in order to achieve Sustainable Development Goals within business model developments or new projects assessments.

In this dissertation, it will be researched how private sector complex and uncertain business strategies should change towards a sustainable balance between economical, social and environmental welfare [28]. The main research-problem explored is: How can private companies and entrepreneurial initiatives embrace the ST4S approach to SEA, in order to create contexts for sustainable development? Taking into consideration that the use of the ST4S approach to SEA include a multitude of agents and whole-system perspectives into the uncertain and long-term decision-making, planning and development processes, characteristic to private initiatives' projects or PPPs (Figure 1.1) [1].

From this, it derives sub-questions as:

- How should private organizations incorporate social constructs (opinions, feedback and priorities) from their internal and external stakeholders, systems and general public into their decision-making, planning and development processes?
- What should be the Critical Decision Factors (CDF)s (aspects that impact the implementation processes of a SEA application, and thus its effectiveness [29]) and Sustainability Assessment instruments that drive the organization's pathways for sustainability?
- How can these organizations prioritize the factors that are addressed in their strategic action plans?
- How should private organizations adopt guidelines that grasp opportunities and eliminate risks of the different strategic options and recommendations for sustainability within each project or PPP?

Briefly, this research simply wants to broaden the view of traditional effects-based SEA in public sector applications, to private corporate initiatives with a strategic approach mindset. This latter condition is essential to the new model of Strategic Thinking for Sustainability (ST4S), built to ease the formal application of SEA and other Sustainability Assessment frameworks in creative transition projects or

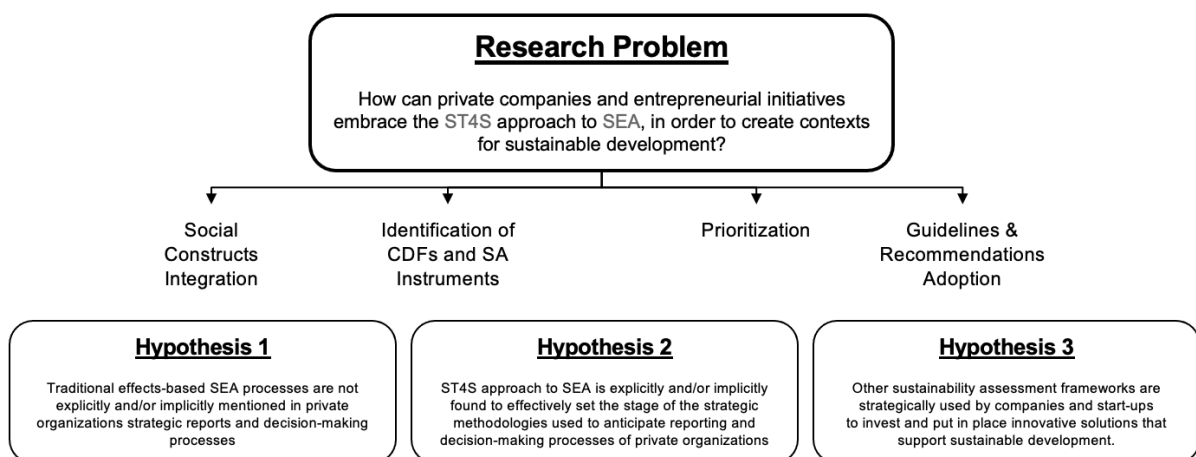
PPPs focused in benefits for sustainability [1].

In other words, the following core hypothesis are going to be tested:

H1: Traditional effects-based SEA processes are not explicitly and/or implicitly mentioned in private organizations strategic reports and decision-making processes (i.e., do not have an active role in the achievement of long-term and complex objectives to reach sustainable development within business strategies and entrepreneurial initiatives). Also, if found present, it is important to evaluate if they are effective and how it can bring benefits to the strategic approaches of private initiatives.

H2: ST4S strategic approach to SEA is explicitly and/or implicitly found to effectively set the stage of the strategic methodologies used to anticipate reporting and decision-making processes of private organizations (i.e., has a fundamental role in the achievement of long-term and complex objectives to reach sustainable development within business strategies and entrepreneurial initiatives)

H3: Other sustainability assessment frameworks are strategically used by companies and start-ups to invest and put in place innovative solutions that support sustainable development.



**Figure 1.1:** Contextualization of the Research Objective, Questions and Hypothesis

This document follows a traditional structure that supports scientific and academic literature. In Chapter 2, it is presented and discussed the literature written around the topics of concern, i.e., SEA, SDG, decision-making processes and other Sustainability Assessment techniques, and the relationships between them. Chapter 3 describes the methodology to explore real case-studies in the private sector and a shared questionnaire that assesses how the strategic approach to Strategic Environmental Assessment is being applied to achieve the Sustainable Development Goals. The applied methodology is based on theoretical and practical knowledge gathered from bibliography and web evidence relevant to the topic of this dissertation. Chapter 4 presents the results and discussions from the questionnaire (sent to sustainability consultants from private organizations) and the case-studies analysis. Finally, Chapter 5 state the conclusions, limitations and potential for future research.

# 2

## Literature Review

### Contents

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2.1 Historical contextualization of the Traditional and Strategic Thinking Approaches to the Strategic Environmental Assessment Instrument . . . . .	9
2.2 Sustainable Development Goals contextualization and its connection to Strategic Environmental Assessment and Private Initiatives . . . . .	21
2.3 Linking Sustainability Assessment, ESG Criteria and EU Sustainable Taxonomy with Strategic Environmental Assessment and Sustainable Development Goals . . .	26

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In this chapter, it is going to be presented the concepts and the ideas essential to the understanding of the main subjects of this dissertation, supported by an extensive and appropriate literature review.

Besides Partidário's particular viewpoint about ST4S as a strategic approach to SEA [1], there are other authors that refer Strategic Environmental Assessment differently from the traditional approach. From those, it is going to be discussed the statements from Noble, Tetlow, Hanusch and Nilsson, among others [18]; [22]; [30]; [31]; [32]; [33].

These other approaches, found in the literature review, explain how strategic SEA can contribute to sustainable decision-making, involving multi-disciplinary teams and collaborative assessment processes [27]; [25].

Moreover, as explained in the Chapter 1, there is also the traditional effects-based SEA approach that identifies, describes and evaluates potential environmental and social effects resultant from a project or PPP [34].

It is important to unlock the role that Strategic Environmental Assessment has in the progress and attainment of the Sustainable Development Goals [25]. The mutual relationships between the SEA and the SDGs concepts are going to be interlinked along this dissertation, emphasizing the benefits that each promote to the other [25]; [5].

In conclusion, the influence of other sustainability assessment instruments to obtain sustainable development, in combination or not with the SEA implementations, is presented.

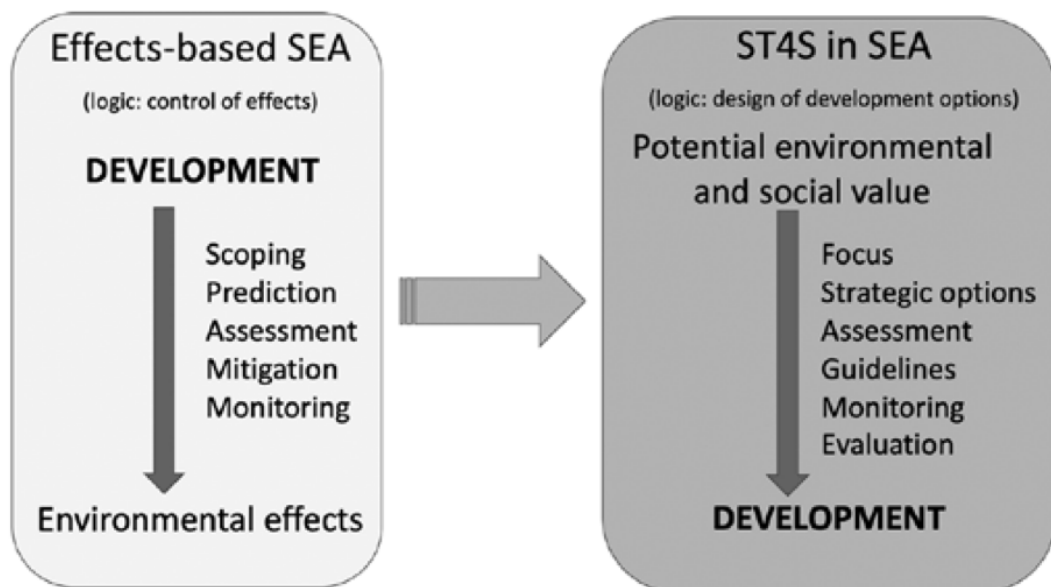
## **2.1 Historical contextualization of the Traditional and Strategic Thinking Approaches to the Strategic Environmental Assessment Instrument**

Before focusing on Partidário's ST4S methodology, there is a step back on the SEA evolutionary history as a relevant instrument in the sustainability assessment field of study. Nilsson and Dalkmann scrutinized the link between decision-making and SEA processes, which started in the 1960s with general environmental assessments, and went through Environmental Impact Assessment (EIA) considerations (before the establishment of the different SEA approaches: conventional and strategic) [31].

SEA succeeded the project-EIA, which was established initially from the 1969 United States National Environmental Policy Act, being reinforced in the 1980s by several researchers on the topic of environmental assessment [18].

Project-EIA main difference to SEA is not considering the complex social, economical, political and cultural contexts that are also at the center of attention today [18]. Project-EIA applications are more adequate to short-term, immediate and punctual decisions [3]. Alongside the effects-based SEA as-

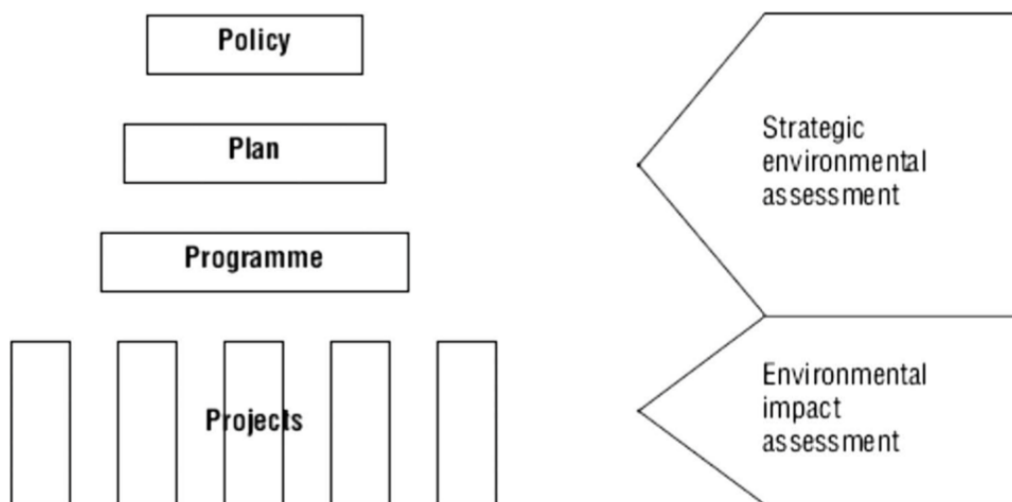
assessment instrument, it protects environmental policy, by studying and evaluating the several direct and indirect impacts, and the viability of a given project, private or public [34]. One of the main weaknesses from project-EIA derived from the fact this method is site-specific, acting upon only one activity or PPP and in a short (mostly nonexistent) planning process timeline, which means, not strategic and proactive, but reactive instead [35] [30]. More, project-EIA suffers from an issue similar to SEA, which is availability and transparency of data, information and resources used to build on the new policy, plan and programme, or the new project [21]; [19]; [22]. Project-EIA follow-up is based in the traditional ideas of decision-making, checking the enforcement of the conditions and terms of application (and its adequacy) to the project approval [20]; [21]. Moreover, EIA (basis for the creation of the conventional effects-based SEA) is focused only in the development process to control impacts on the environment, contrarily to the ST4S approach to SEA that should be considered early in the planning and decision-making processes in order to present alternative courses of action (Figure 2.1) [18].



**Figure 2.1:** SEA Approaches (source: [1])

After, the conventional effects-based SEA became the norm. It complemented the project-EIA instrument, allowing for studying the full scope of tiers in the decision-making process (Figure 2.2) [33].

The predictable methodology of the conventional effects-based SEA has standard guidelines of application that can sustain SEA projects or PPPs that vary in time and location [32]. Basically, similarities were found to sustain that the SEA process implementation starts with the decision of subjecting a project or PPP to a specific assessment [33]. Then, it follows a well-structured number of iterative and sequential steps: screening activity to search for potential negative or positive environmental impacts of a PPP or project; preliminary disclosure of findings through an environmental report; scoping activ-



**Figure 2.2:** Tiering of Decision-Making Subjects of Application (source: [2])

ity to identify and clarify issues with assistance of environmental or competent authorities; study and assessment of the detailed analysis of key problems and alternatives in the process; follow-up, evaluation, communication and monitoring of the final environmental report, with the help of general public and stakeholders participation [36]; [37]; [33]. In addition to early and ongoing information of the current PPP or project being assessed, it requires the access and availability to data from previous successful SEA implementations, to increase accountability for publishing the real impacts resultant from the specific project or PPP to the mainstream audience [38]; [33].

A group of authors, in 2006, recognized SEA as an instrument to support decision-making, planning and development processes, that incorporate environmental, social and economical concerns into projects and PPPs [33]. As observed superficially in the Chapter 1, the implementation of SEA legal, institutional and procedural frameworks depend of each national, regional and local jurisdiction and governmental approach [36]; [33]. These authors studied the several challenges that a SEA process implementation faces in different countries, under varied economical and social conditions, and how flexibility and replication can be used for future research or application [33]. A consensual blueprint for strategic SEA was not reached yet, as it is constrained to uncertainty and singularities of each country [33]. But, it is undeniable its growing worldwide acceptance and cooperation for transparency in international organizations' decision-making and planning processes for sustainability [33]. The most extensive sectors where SEA processes have been employed are in the land-use, local master and urban planning, transport, water management and extractive industries [3]; [18]. They also refer the fundamental role of consultation and democratization of general public and stakeholders' insights to the project or PPP implementation itself [33].

Strategic approaches to SEA are first mentioned by Partidário, in 1996, and reinforced in Noble's arti-

cle (June, 2000), where it was acknowledged the strategicness capability of the Strategic Environmental Assessment instrument [17]; [30]. In 2007, Bina recognized three different approaches to Strategic Environmental Assessment: strategic (to help proper assessment at early stages of the PPPs planning processes), procedural (based on the institutional, administrative, political and cultural context, it proactively expands the scope of SEA and its causality to techniques for mitigation and monitoring of environmental impacts) and purposeful (relate to focus on social and economical impacts, beyond environmental) [39]. This author sustained the practicality of these arguments, singularly or in combination, when looking to promote sustainable development across a project or PPP life-cycle: initial planning, ongoing development and final implementation [39]. Moreover, in 2009, Nilsson and Dalkmann investigated the idea of integrating sustainability concerns in PPPs or projects' strategic decision-making processes using the Strategic Environmental Assessment instrument [31].

It was found that there was a lack of awareness towards strategic thinking in the planning, decision-making and development processes of a project or PPP [30]. Besides common foundations along traditional effects-based SEA (for example, early assessment of environmental and social impacts), Noble identified the following characteristics as defining of a strategic SEA: emphasis on strategy, i.e., setting, early in a project or PPP pipeline, an action plan that activates resources to achieve desired outcomes; visions and alternatives, i.e., process of identifying an obstacle, contextualizing it within a system, assess alternative solutions and perform a plan to obtain business objectives and sustainable development; objectives, targets and criteria, i.e., measurements to evaluate the vision and alternatives' compatibility with the desired outcome, in the form of environmental, social or economical goals, milestones and parameters; proactivity, i.e., anticipating conflicts and issues resultant from the single or combined application of the strategic options found before; broad-brush and non-technical, i.e., SEA does not has technical foundations, allowing it not to be project-specific, but instead, easily adaptable to multiple situations where the end goal is to assess alternatives that foster opportunities and undermine risks for sustainability [30]. To conclude on these characteristics, Noble studied 18 SEA practical case-studies, where he found that only 11 are strategic, but the other 7 are based in a traditional effects-based SEA. Lastly, based on the previous characteristics, he defines SEA as an issues-driven instrument.

Alongside Storey, Noble structured the insights produced in the previous paragraph [32]. This structure takes into consideration the tiering of the different PPPs and projects that are subject to strategic sustainability assessment, in order to address and prioritize environmental and social concerns [19]. PPPs are envisioned as planning and development processes that kickstart with a policy implementation, acting upon a defined programme that is settled under a broader plan [30]. The end-goal is the individual project that is derived from the stages above [30].

Building a consensual methodology for strategic SEA was a open opportunity to be explored [32]; [17]. The usual statement would be to utilize it as an effects-based sustainability assessment instru-

ment, but this two authors preferred to create new road-maps that are truly effective in its application to real-life [32]. Effective SEA guidance allow for changes to mentalities in the long-term (as employees and general public become aware of the benefits from SEA application to enhance sustainability), turning decision-making processes into a strategic perspective and searching for the actual root causes of the problem from the earliest stage of plan definition as possible [3]. For a SEA process to be found as effective, it is required to be integrated, sustainability led, focused, accountable, participative and iterative [18]. However, there are not consistent results about overall SEA effectiveness into projects or PPPs. The effectiveness criteria considered to evaluate SEA processes are within the following dimensions: contextual (real-life macro and micro-environment conditions surrounding the project); pluralistic (time-consuming and expensive two-way communication between stakeholders and general public); substantive (influence of wording in the plan or project's environmental reports); normative (goal attainment and succeeding monitoring activities that help to achieve sustainability goals); knowledge and learning (mentality changes and external SEA experts/actors involvement that lead to different practices in future projects); and transactive (a very debated topic of discussion in recent literature about the costs and time expenses to the employment of these strategic thinking approaches) [40]. These criteria are prioritized and analyzed imperatively together [40].

Storey and Noble suggestion for strategic SEA is to start by contemplating the characteristics, mentioned in the previous paragraphs, in the planning, decision-making and development processes [32]. Next, increase flexibility between the application of SEA within the different levels of a PPP: policy, plan and programme, and a project [32]. Thirdly, understand that SEA is about prospecting alternative courses of action through relevant research questions and decision windows [32]. Finally, set a higher-level and systematic activity to evaluate multi-criteria problems (environmental, biophysical, social and economical) and choose the preferred corresponding alternative solutions that bring the most benefits [32].

The most interested parties involved are the action-leading agent (organization responsible to develop the PPPs or business/investment projects and evaluating if it is under the scope of SEA, consulting entities whom might be interested in the outcomes), the competent authority (if public, usually governments, but, if private, usually the action-leading agent itself, accounting for (non-)qualifying the plan or program and making it available online), the environmental authorities (attribute information and act as consultants in the SEA process, elaborating reports with scope definition) and the public (which still has its importance constrained to pressure groups, for instance, elected representatives) [37]; [36]; [3].

Tetlow and Hanusch, in 2012, compiled a study of the current state of the art related to Strategic Environmental Assessment [18]. After a literature review to the existent documentation on the topic, they summarized the several perspectives and adaptations done to this instrument over the years [18].

With a Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis type of approach, Tetlow

and Hanusch understood that SEA can be applied referring to a variety of baselines that is still growing, from the most traditional to the more strategic one [18]. Independently of that, they wanted to show how SEA supports planning, decision-making and development processes through collaborative ways of working that enhance public participation in the SEA processes capacity building [18]. This final objective was demonstrated, as other explicit and implicit gains from its application: surpassing older impact assessment instruments limitations (by being applied early in the planning process, and not only during development; using sustainability outcomes as the end goal; and embracing multi-agent projects that report to an extended group of stakeholders); and prompting organizational learning, innovation and transparency. As stated by Bina, in 2007, the strategic approach to SEA allows to use this instrument in specific windows of opportunity, early and during the project or PPP [39]. This facilitated the introduction of the concept of "decision windows" into the different road-maps for application of a strategic approach to SEA [18]. Ultimately, Strategic Environmental Assessment will merge with the planning phase of a project or PPP to inherently think about sustainability issues when preparing a process implementation [18].

Going back to Noble findings, in 2014, with Acharibasam, they evaluated the consequences of Strategic Environmental Assessment in projects and PPPs [22]. As can be inferred from the previous analysis, SEA has, indeed, a role on projects and PPPs, but the extension of its influence in their strategic pathways is limited, and not easy to differentiate from innovative practices endured by other instruments for decision-making, planning and development processes [22]. This limitation is due to missing convergence between the agents involved in the implementation processes, and the impatient attitudes to reach practical outcomes that are set as long-term [22]. These authors also build on top of Tetlow's and Hanusche definition of SEA effectiveness, stating it is different from performance or compliance to defined steps of implementation [22]. Actually, in this paper, it is emphasized the value-adding characteristics of implementing a strategic approach to SEA, whether in a project or PPP [22]. These characteristics are public consultation, early assessment of environmental, social and economical impacts, motivation for innovating and researching new solutions (products, services, processes or systems), influence in institutional and managerial practices, and in the organizations' governance models [22].

Summing up, SEA is definitely a continuous and systematic instrument of environmental policy that facilitates decision making, adds value at different decision strategic levels and manages conflicts with all stakeholders to reach win-win situations [34]; [3]. To amplify its strategicness capacity, SEA must be seen as a plan-shaping process, not a fine-tuning activity of projects or PPPs in order to impact positively the environment and human systems [22].

Note that these strategic SEA applications are seen, by the above authors, as a complementary construction to other instruments: project-EIA and the Sustainable Development Goals (the latter one will be explored further in the next sub-chapter) [15]; [1]. There is no one-size fits all approach to strategic

SEA yet. It is a flexible and contextual methodology [25].

To wrap up, project-EIA and traditional effects-based SEA evaluate the terms for the decision-making processes and try to advise on appropriate mitigation measures to sustainability concerns, while the strategic approaches to SEA determine if those factors underpin the development processes, elaborating guidelines and managerial good practices [3]; [1]. Nowadays, Non-Governmental Organizations (NGO)s, other responsible organizations and associations that desire to learn more about improving their sustainability efforts, are considering this tool as well [3]. The Directive 2003/35/EC, of 26th of May, and the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, signed in 1998, accentuate the cooperation of all citizens in the application of environmental PPPs [18].

The summary and main differences between strategic thinking and traditional approaches to SEA, according to Partidário [1], are in the Appendix B, table B.1.

### **2.1.1 ST4S Approach to Strategic Environmental Assessment Application within Business Strategies and Entrepreneurial Initiatives**

As explored in the previous section, SEA can be approached through the narrow vision of only social and environmental impacts evaluation (effects-based). But this simplistic consideration does not allow to create a positive end-result, mostly if a private company or entrepreneurial initiative already utilized a significant budget to develop a plan, program or policy, as they will not be keen to give up on that project only because of sustainability issues, as it would damage their profitability and costs management [41].

In this sense, it is desired to shape the plan, program and policy since the very beginning with a strategic thinking process. As mentioned in the literature [1], SEA applications should be planned from scratch (business or investment plan conceptualization), with the final objective of promoting sustainable development (allowing the decision-making team to pursue an iterative process along the project or PPPs development and assessment). This team has several ways to endure decision-making: rationalism (literal use of rational and objectives-driven schemes to make a decision); incrementalism (reaction to externalities); and process models [31]. It was found that rationalism is an utopia to real decision-making and planning processes, instead of incrementalism and process models that promote gradual decisions that are more easily analyzed under structured or unstructured multi-actor contexts [31]. Therefore, a combined model for decision-making should overcome the inefficiencies of rationalism and incrementalism, engaging on top of the advantages describing each approach [31].

Here is where the specific ST4S approach to SEA enters in action. This is a theoretical model, developed by Partidário, that incorporates strategy in the decision-making, planning and development processes of projects and PPPs subject to a SEA application [1]. As referred in the introduction, it is founded in systems and sustainability transition theories, besides the common implications to other



strategic approaches to SEA that were described in the previous section [1]. These include the incorporation of multi-agent dialogues, complex governance systems and uncertain long-term objectives in continuous and iterative decision cycles [1]. To conclude, Strategic Thinking for Sustainability (ST4S) injects strategic practices to the context of formation and formulation of projects, programmes, plans and policies for different pathways to sustainable development (Figure 2.3) [1].



**Figure 2.3:** ST4S contextualization (source: [1])

The use of Sustainability Transitions theory helps to creatively construct nonlinear innovative routines to engage stakeholders in transparent and easy communication activities, and to reach transformative and strategic solutions for sustainable development [42]. The following environmental and social dilemmas: climate change, water scarcity, poverty, health crisis, biodiversity loss, soil depletion, social distresses, terrorism, changes in production and consumption behaviours and the uptake of digital technologies (for example, Artificial Intelligence (AI)), represent the trends and global challenges to which Strategic Environmental Assessment must convey with a strategic mentality, i.e., way beyond the effects-based SEA traditional approach [42]; [1].

Strategic thinking and evaluation always starts from the top-level managers who decide upon the initiatives that can be worked on in the different strategic areas of business [43], explaining ways of thinking, attitudes and actions to be endured [3]. Furthermore, the managers are responsible for the recognition and evaluation of the change and strategic process, leaving the planning and execution to their subordinates [43]. Needless to say, innovation and entrepreneurship, through new ventures or intra-



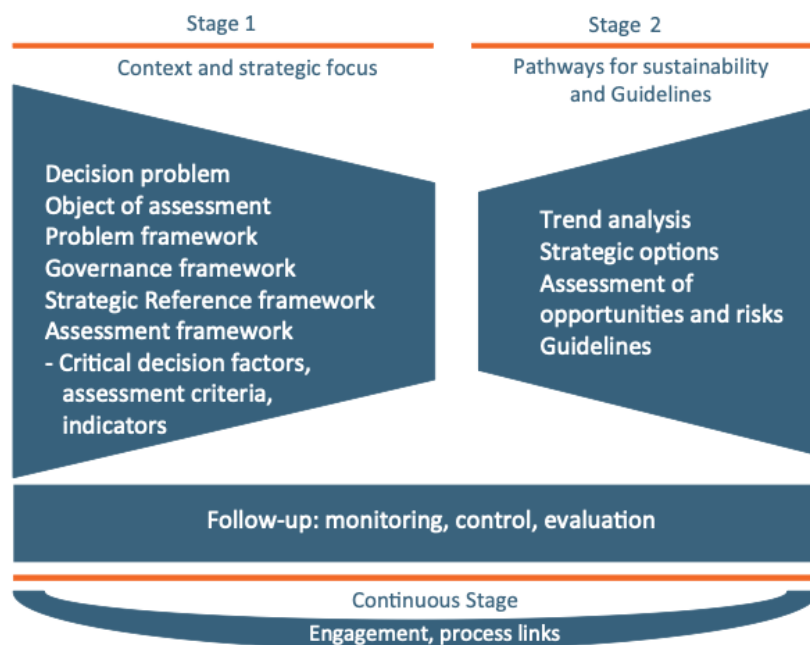
business projects or developments, are the vanguard of present ideologies. They are the ingredients to growth and sustainability in the World, as it is going after real-life customer problems and needs. As Partidário, 2021, page 5, [1], stated: "strategic thinking (...) requires intuition, logic, argumentation and a lot of flexibility to work with complex systems (...), a capacity to reorganize the means when losing sight of the objective, to adapt to contextual changes (changing pathways or routes when necessary), and to remain strongly focused on what is really important in a broader context (time, space and perspectives)."

It is crucial that the strategic vision and mission of the company, as defined by its Chief Executive Officer (CEO) and top-managers, is in the same scope and context as the entrepreneurial and business strategies pursued by the employees [43]. Strategy definition, in its traditional sense, was about analyzing past successes and failures to move to a better future, learning about resource allocation, goal attainment and others [43]. Besides these ideas, each individual can also go for autonomous strategic actions, i.e., entrepreneurial activities [43]. The leaders of the organization must set the environment and establish the rules, so they are the central element to bring the basic mechanisms discussed previously, such as, the SEA, to the horizon of the company's projects and PPPs [43]. Moreover, they should be ready to change according to events that occur unpredictably [1].

Organizational innovation and change management (Strategic Business Units (SBU)s or new venture-wise) come from the resurgence of an individual's entrepreneurial activity, which is hindered if the purposed novelties are constrained to business or investment plans concerning economical and environmental sustainability. Strategic behaviour expands organizations' capabilities and resources, enhancing synergies with other partners (companies, suppliers, etc.) to obtain common objectives [43].

Basically, strategy can be seen under the Mintzberg's 1987 5 P's, [44]: plan (early, general or specific, action plan to approach a given situation); ploy (tactic to perform the plan settled in the previous step, outwitting competition); pattern (consistent sequence of behaviours that realize the strategy); position (match between external and internal context surrounding the situation and its outside environment); and perspective (internal approach to integrate and evolve from the present state to a desired future scenario). This five stages for strategy should be kept in mind of any internal or external SEA change agent, responsible to perform organizational innovation. In line with Kørnøv, in 2021 [45], a change agent is someone capable to impact decisions, at an economical, operational, environmental and social level of the organization. Moreover, it is stated that change can be performed by a methodology, as the Strategic Environmental Assessment instrument explored in this dissertation. But, it always requires the transparent action of individual human resources to develop a process. In the perspective of change agency, SEA, as a strategic approach to sustainable development, gathers an ample scope of procedural activities common to the overall organizational change theory, mostly with the relevant significance given to the cooperation of stakeholders in an iterative and systemic process (by the use of meetings, surveys, open-days, workshops, focus groups and other forms of direct involvement with the public) [4].

Figure 2.4 deliver more detail in the description of the ST4S methodology to strategic SEA, that was first presented in the Figure 2.3. This methodology emphasizes the integration of biophysical, social, institutional, political and economical issues in the decision problem definition and the respective frameworks for project or PPP contextualization (object of assessment, problem, governance, strategic reference and assessment of critical decision factors, criteria and indicators) [1]. Second phase brings to light the importance to study the strengths, weaknesses, opportunities and risks of many strategic options, pathways and guidelines that add value to the decision-making, planning and development processes [1]. The last phase is about reporting to the public, engaging in a full and extent follow-up and monitoring process. These reports seek to promote a strategic and responsible mindset for cultural change [1].



**Figure 2.4:** Phases of the Strategic Thinking Approach for SEA (source: [3])

The road-map to identify critical decision factors starts by detailing the preconditions and assumptions for the project or PPP, and the taxonomy that expresses the ideas and philosophical thinking behind the proposed alternative strategic options [3]. The SEA process embrace decisions and changes to the project or PPP's life-cycle according to the critical decision factors (social, economical, institutional, political and legal) that influence the SEA's application impacts on sustainability systems [29]. Next, it applies the SEA process to structure and prioritize the elements that will drive the strategic focus of the project or PPP [3]; [1]. As mentioned before, this systemic procedure will face cyclical, i.e., iterative decision-making considerations, through participation and continuous dialogue between stakeholders involved, directly or indirectly, and issuing guidelines and recommendations [38]; [1].

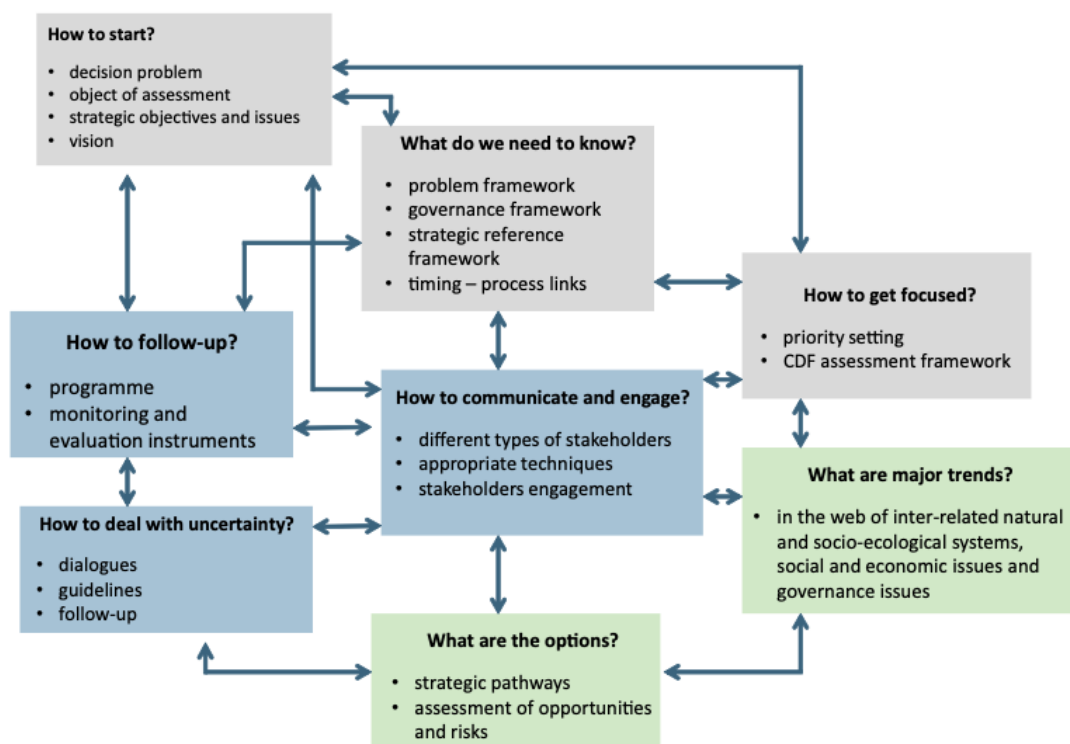
Networks of knowledge and path dependencies are shared amongst every participant in the SEA decision-making, planning and development processes, allowing to benchmark the considerations set in the beginning with possible strategic futures and unexpected events [3]; [1]; [16]. As reinforced in the previous paragraphs and sections, SEA's taxonomy must also be reviewed to include strategicness values, consolidating whole-system paradigms and integrating the necessary but enough number of entities into the decision and validation processes [3]; [1]. The key structural elements in a ST4S approach to SEA road-map include:

- 1. Object of assessment
- 2. Driving and Constraining forces
- 3. Environmental and Sustainability Issues (ESI)s
- 4. Strategic Reference Framework (SRF)
- 5. Critical Decision Factors (CDF)s
- 6. Governance Framework
- 7. Strategic Options
- 8. Opportunities and Risks
- 9. Follow-up

Therefore, with all the case-studies to be analyzed, it will be determined: the object of assessment (what is intended in a multi-agent perspective, from strategic options and sensitivities till any relevant potential problem); driving forces or problem framework (that support/push for change, i.e., embraced by the project team and its workers), and the ones restraining change and inhibiting the strategy; environmental and sustainability issues to be addressed; the Strategic Reference Framework, SRF, (represent the macro-assessment of the PPP or business/investment plan scope); the CDFs (key aspects involved in the overall planning and programme development. Should be between three to five and less than seven, ensuring strategic focus); Governance Framework (frames institutional main responsibilities: decision-making; cooperation; practice; governance; identification of stakeholders, their responsibilities and relationships; and public consultation [3]); Strategic Options (defined number of alternative courses of actions to the intended long-term objectives, associated with the company's vision and mission and the project/PPP typology); identification of the external and internal key factors (by a tool similar to a SWOT or Trend Analysis, which relates to the set of facts gathered along a period of time and that are capable to define a pattern or trend); monitoring (guidelines or recommendations that plan, manage and

direct development towards the success of the implementation of the strategies and objectives being assessed); and follow-up (principle of continuity to enable a strategic assessment of how development is happening and the role of inter-relationships and adequate communication bridges between stakeholders in the conceptualization of projects and PPPs) [3]; [1]. The end-objective is to get to the root causes of the problem in concern (not the symptoms that surround it), by developing alternative scenarios to sustainability and facilitating strategic thinking into key decision windows [1].

All in all, as will be seen in the next chapter in the application to real case-studies, the strategic SEA road-map based on the methodologies described previously, is presented in Figure 2.5:



**Figure 2.5:** ST4S Approach for SEA Road-map (source: [3])

The key elements of Strategic Environmental Assessment described above are essentially social constructs, i.e., stakeholders and general public are an active and dynamic part of the SEA context [26]. Strategic Environmental Assessment works to change towards proactive, non-complacent and sustainable ways of working, prioritizing planning and implementation as soon as possible in the projects or PPPs envisioned [27]. The willingness, from the decision-makers, to take into account the CDFs and the SEA's process insights early-on, dictates the possible adoption of the SEA's findings and adequate recommendations later in the project or PPP. Finally, as will be discussed by the questionnaire and case-studies from the methodology and results chapters, there is a clear difference between performing

correctly a SEA process and being technically capable to do it in an adequate scientific and strategic way [26]. This is usually endured by professional consultants, authorities and in-house experts [26].

However, there are limitations to a strategic SEA application. Basically, after any SEA implementation, it is not easily identifiable the person responsible for its management [21], and so, this concept of observing the impact of a new policy or project by a government or private corporate, respectively, needs to be better discussed and measured [21]. This strategicness thinking process applied to innovative initiatives is very difficult to demonstrate, as it is not their top-priority to search and report the consequences of their SEA-related environmental measures incorporated into the project.

Another limitation relates to the impossibility of being fully comprehensive in the analysis, as a policy or a project with its complexity and uncertainty does not remain stable forever, since some adjustments are done to the focused objectives at some point in time [21]; [19]. Practically, strategic choices, decision-making windows and other plans are dynamic and multi-directional, rich in complexity and uncertainty [21].

There are already examples of SEA applications to business strategies [46]. The significance given to the creation of standard evaluation scales, to see if SEA processes were performed accordingly, is a recommendation to the overall improvement of the SEA process (which can be translated to any business strategy and/or entrepreneurial initiative) [46]. Interesting to note, there is an increasing number of voluntary SEA cases by external states or institutions, since SEA is regarded to provide environmental benefits.

Next, it is addressed how this instrument can help to attain the complex and very present issues characterized in the 17 Sustainable Development Goals, which, in turn, must be looked at in an interlinked and complete way [45].

## **2.2 Sustainable Development Goals contextualization and its connection to Strategic Environmental Assessment and Private Initiatives**

To align the Sustainable Development Goals with the ST4S approach to SEA within private initiatives, it is firstly contextualized the historical information about this blueprint for sustainability.

It starts with the Agenda 21, approved in Rio's Conference, in 1992, as a precursor of the SDGs and one of the boldest and broader plans of action to promote social and environmental justice, combined with economical efficiency [34]. Here, it was reinforced the vision from the Brundtland Report from 1987 [47], that talks about a model of development which allows the present generations to satisfy its needs, by not compromising the possibility of future generations to satisfy their own needs. The evolution of this

event is reflected in the Aarhus Convention, on 25th of June 1998, where it was defined sustainability as a responsibility of everyone and of the democratic interaction between the general public, the authorities and the private initiatives, establishing healthy relationships between environmental and human rights [34]. This thought was the base to the Rio+ Conference, in Rio de Janeiro, in 2012, that followed discussions on this topic of sustainability, and built a global agenda to address this ongoing, complex and extensive issues that involve all humanity [34].

In September 2015, directed by Mr. Ban Ki-Moon, as the 8th Secretary General of the United Nations, the 2030 Agenda for Sustainable Development debated a vast number of issues in the World, to prioritize in the future of sustainable management [48]. It was approved by the 193 members, resulting from the collaborative work of governments, private sector initiatives and citizens around the world to create a new global model to end poverty, promote prosperity and well-being for all, protect the environment and fight climate change [48].

The SDGs came to replace the Millennium Development Goals (MDG)s, which were created in a hurry, not involving world's citizens feedback, and a lot of points were left unfinished by lack of political support [48]; [49]. Nevertheless, all these subjects, the SDGs, SEA, etc., are political questions, and so, very dependent of society's leaders and their mindsets and beliefs. However, UN always tried to convince the public that the basis for the Sustainable Development Goals was written under equity and responsible foundations (searching to not being influenced by the wealthiest and resourceful individuals and/or organizations) [48]. The SDGs (adopted by all 193 United Nations Member States on the 25th of September 2015) are sustained by the Universal Declaration of Human Rights, freedom (of speech, want, worship and fear) and other philosophical considerations [48]. They work on surpassing and achieving shared blueprint goals, mis-specified in the MDGs (for example, private sector influence and role for sustainability, irresponsible production and consumption, and strategic execution of plans and objectives) [49]; [50]. However, MDGs were successful to reduce poverty, increase gender equality and access to health systems (mainly in the less developed countries) [49].

As seen in Figure 2.6, there are 17 goals, 169 targets, 232 indicators and 1309 publications across biosphere, society and economy, supported by ideas from regular citizens, companies and governments (from developed and developing countries), which showed the power of involving external feedback for sustainable growth policies [48]. To involve all round concerns: 74 targets focus on people (poverty, hunger, equality, etc.), 35 targets focus on the planet (natural resources and climate); 41 targets focus on prosperity; 19 targets focus on partnerships; and peace is considered as a horizontal target [4].

SEA and the SDGs are mutualistic in the process to foster sustainable development (Figure 2.7). They can co-exist to create gains, not only in the climate change combat, but also in other social and economical issues of concern [5]. To do this, SDGs are seen as the "ends" and the SEA as the "means" [5]. The synergies and benefits between the two instruments have been only discussed in re-

## SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

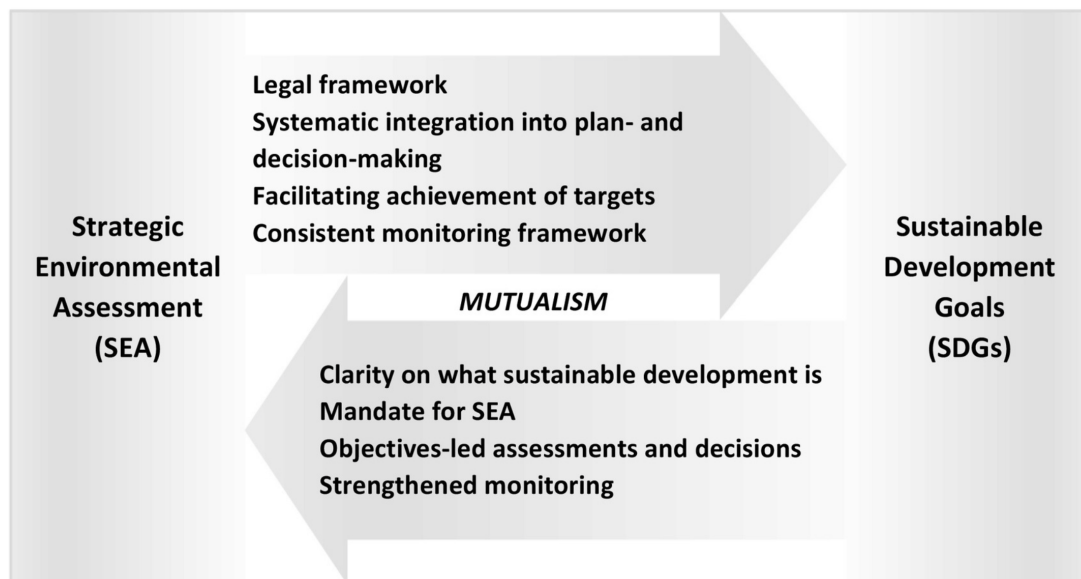


**Figure 2.6:** SDGs - Sustainable Development Goals (source: [4])

cent and scarce literature, but it has proven that SDGs are embedded with hesitation in SEA processes, at different and case-specific levels of the strategic plan- and decision-making [5]. For Sustainable Development Goals to be fully embraced in SEA processes, they need to define explicit instructions to the SEA practitioners [5]. It is essential that private companies and initiatives appoint all the 17 SDGs and its inter-dependencies, as a systemic objective, and not, the selective and few ones that they can easily answer to [19]. Furthermore, the monitoring phase of a SEA process should include Sustainable Development Goals within its analysis, which fosters the need to engage with governments, researchers, private initiatives and the general public [5]. According to the SDG target 12.6, the European Union composed the Directive 2014/95/EU, which subscribed its member states to monitor non-financial declarations from companies (for instance, public organizations, banks, etc., with more than 500 employees) about environmental and social protection, anti-corruption and bribery, among other managerial best practices [51].

SEA and project-EIA pre-date the SDGs, therefore, promoting links between them can consolidate strategic SEA implementations to sustainable development, within companies and start-ups, while informing action and acting upon the support of the 2030 Agenda [5]. International Association for Impact Assessment (IAIA), 2019, page 2, stated: “on the one side, SEA and other legislated impact assessment tools can play a crucial role in mainstreaming sustainability considerations in development, planning and decision-making; on the other, applying the SDGs targets will help make impact assessment more





**Figure 2.7:** Relationship between SEA & the SDGs (source: [5])

objectives-driven, rather than process- or impacts-oriented, and will increase its relevance as a planning foundation for development plans and project decisions” [52]. Finally, incorporating the SDGs objectives in the SEA decision-making process allows to build a formal, systematic and logical approach, with SEA controlling, auditing and following-up the implementation plan [5].

Operationalizing the SDGs is very difficult, as incorporating Sustainable Development Goals in SEA applications is hindered by the complex scope of both these two instruments [5]. Also, there is reduced awareness, understanding and know-how to conduct SEA processes to attain SDGs effectively by other parties (such as, private initiatives) than the governments from member states of the United Nations [5]. On top, the SDGs are weak on agency, not obliging governments, businesses, new ventures or consumers to strongly follow them, by only focusing on the impact and neglecting driving forces to its application, which leads to failure of accomplishing the goals proposed or employing a misplaced implementation [53]. Moreover, non-existent standards, frameworks and benchmarks to assess SDG engagement are very significant in the private sector (recent resurgence of tools, for instance, the United Nations Global Compact and GRI) [54]; [55]; [56]. The SDG Compass demonstrates the process for a private initiative to align its vision, mission and strategic goals with the attainment of the Sustainable Development Goals, and the internal and external stakeholders expectations (in other words, explains best-practices when writing sustainability reports that are disclosed to public and may help to attract investment in the company’s shares, based in analysts recommendations) [56].

The strategic advocacy role of a SEA process that is searched within business strategies and entrepreneurial initiatives for the achievement of the SDGs is the constructive approach: “when SEA main purpose is to help decision-making drive strategies towards better environmental and sustainability inte-



gration. This means that the SEA is designed to facilitate decision-making. The priority is to use SEA to understand the complexity of decision-making, its needs and priorities, and to assist in a mutual learning process about how environmental and sustainability issues can be constructively built into decision-making. The outcomes of the SEA are embedded in the decision-making cycle, inputs are made at key moments (decision windows) when it can actually make a difference and add value.” (Partidário, 2015, page 5), since it benefits environmental integrity and pushes for more responsible and sustainability driven decision-making [27]. But, the influence of a SEA process in reaching specific targets from the SDG and Agenda 2030 is blocked by strong governmental and regulatory legislation, hindering the integration of these objectives in the decision-making, planning and development processes of a project or PPP [5].

Based on Hacking, Partidário and Del Campo, [19]; [1]; [5], private business strategies and the accomplishment of the Sustainable Developments Goals are interlinked because of the necessity to integrate sustainability considerations in the planning and development of projects or PPPs, beyond financial ones (in order to comply to regulatory legislation and directives). The use of SEA as a strategic thinking instrument in transition processes for sustainability, differing from the traditional effects-based SEA, looks at the future strategic options products of causality (“where we are and where we want to be”), instead of pre-identified PPPs proposals. Private sector companies and initiatives are taking the SDGs more seriously into their strategic plans and reports, but the mentality is, a priori, focused in an objectives- and profitability-driven process, and then, a posteriori, into responsible actions (environmental, social, etc.). However, studies have found a positive correlation between sustainable development practices, and economical and financial performances [57]

Recently, literature has been considering the relevancy of the SDGs for business strategies and entrepreneurial initiatives. A large number of multinational big-sized companies produce more than the total production of some developing countries, therefore, they are key players in the strategies envisioned for sustainable development [49]; [55]. Pedersen state that these environmental, social and economical goals push private initiatives to strategize on forthcoming investments and long-term decision-making, planning and development processes settled under specific business model establishments and opportunities [49]. Private initiatives contributions are seen as motors for sustainable innovations, by considering the assessment and prioritization of new solutions and partnerships, and the corresponding impacts of these activities on the several SDGs, allowing for the alignment of the private sector with the political agenda (policy makers and society), and obtaining economical rewards in sync with the offering of products, services or processes that answer to customers needs [49]; [55].

There is still sparse information about the progress and effective practices endured by companies in the achievement of the SDGs (besides the fact that they are indeed incorporating these concerns into their strategies, priorities, policies and projects) [54]. Some difficulties to be improved in the assessment

of these goals in the private sector are: lack of a transparent and robust approach to prioritize SDGs and the, direct and indirect, positive and negative, impacts measured by this tool (cherry-picking, i.e., addressing the SDGs more easily related to their sector of activity); lack of obligation to incorporate SDGs into the long-term and existing corporate sustainability strategies (i.e., integrating the SDGs in the sustainable pathways already defined in the companies); lack of linkage between the SDGs and other Corporate Social Responsibility (CSR) objectives (for example, human rights, gender equality and value chains); and lack of frequent implementation, measurement and reporting on the SDGs engagement (higher probability of large size organizations, with women and younger executive boards, to voluntarily disclose information regarding sustainability, and participate in external validation/assurance (International Organization for Standardization (ISO) and AccountAbility standards)) [54]; [55]. Companies and start-ups must pivot their interaction with this tool, in order to ambition a more significant and active role in the attainment of the SDGs (in addition to the current communication activity) [54]; [55]. This blueprint requires more from the business sector, than the business requires from the SDGs in terms of financial outcomes [54]. It was found that private organizations are increasingly reporting their commitments to sustainability, focusing in adequate governance and Key Performance Indicators (KPI)s assessment activities [54]; [55].

More in this topic is discussed in the next section, where it is distinguished other instruments, for example, Sustainability Assessment (SA), Environmental, Social and Governance (ESG) Criteria and EU Sustainable Taxonomy.

## **2.3 Linking Sustainability Assessment, ESG Criteria and EU Sustainable Taxonomy with Strategic Environmental Assessment and Sustainable Development Goals**

The linkage between the SEA process, private initiatives and the SDGs has been increasingly acknowledged, as shown in the previous sections [27]. But, other instruments compatible with the strategic SEA planning and decision-making processes have emerged, essentially, SA, ESG Criteria and EU Sustainable Taxonomy [19]; [28]. They support the objective of turning sustainability concerns to the core thinking of new businesses and ventures, at the private corporate level, or new policies and legislation, at the public sector level [36].

Starting with SA instruments, Hacking and Guthrie, in 2007, denoted their function in promoting sustainable development [28]. SA started being used to complement traditional effects-based SEA applications, so, in these terms, it can be seen as a proximity to the strategic SEA approaches presented before, highlighting the role of the socio-economical and political effects in sustainability, beyond the

biophysical ones [28]. In fact, due to the integration and scope extension of these dimensions into the conventional effects-based SEA process, it was introduced two specific techniques: Integrated Assessment and Triple Bottom-Line Assessment, which began to cover a broad analysis of the different strategic decision levels (projects, programmes, plans and policies) [28]. There are other more specific techniques that were enumerated to be used in combination to SEA and EIA, in order to incorporate the three pillars of sustainability (environment, society and economy): Social Impact Assessment, Health Impact Assessment, Economic Impact Assessment, Environmental Social and Environmental Impact Assessment, Gender Impact Assessment, Cumulative Effects Assessment, Life-Cycle Analysis (LCA), Multi-Criteria and Cost-Benefit Analysis [28].

Hacking and Guthrie describe the main characteristics that drive Triple Bottom-Line and Sustainability Assessment into attaining long-term, complex and uncertain environmental, social and economical objectives [28]. The first was context, i.e., the contextualization of the decision-making, planning and development processes into the assessment methodology [28]. Secondly, process was brought to the center of discussion, identifying the responsible agents, location and timing to implement these strategic assessment instruments [28]. Lastly, internal assessment characteristics, for example, degree and type of reasoning [28]. The three concepts were found to be equally relevant to sustainable development, still, they are influenced by other aspects internal to the responsible organization and agent of assessment, which are skills and capacity building, disciplinary protectionism and institutional structure [28]. From this paper, it is retrieved also an important idea about the benefits of Strategic Environmental Assessment in the attainment of the Sustainable Development Goals within private initiatives (companies and start-ups). That idea cites that the normative tiered assessment of projects and PPPs should be iterative across these strategic levels (top-down and bottom-up relationships) and that there is limited research addressing the links between projects and PPPs developed by private initiatives with strategic decision-making and planning processes [28]. A final critic presented by the authors is the lack of standard measures that can judge sustainable development and help combine the instruments used to achieve that (a common difficulty of these techniques, but also, SEA and EIA) [28].

Secondly, ESG is an environmental, social and governance responsibility method to engage in sustainable investments and activities. This approach, first discussed in 2004 by a group of 20 financial institutions, due to a request from Kofi Anon, Secretary-General of the UN at the time, is built on top the relationship between corporate responsibility and financial performance [41]; [58]; [59]. It was found, by Halbritter and Dorfleitner, in 2015, that high ESG ratings are not always positively correlated to high financial returns, depending on the provider (for example, ASSET4, Bloomberg and KLD), private initiatives sampled in the study and time period considered [41]; [59]. Therefore, in the same ESG portfolio, it can not be significantly distinguished if financial returns are more positively correlated to private initiatives with high instead of low ESG ratings. This sustains the fact that the portfolio diversification is not

clear to bring positive financial outcomes and sustainable development in the decision-making, planning and development processes of a company or start-up [41].

This emergent methodology, as will be addressed in the next paragraphs as well, supports standard classification and taxonomy to promote sustainable investments (Socially Responsible Investment (SRI) - investment that subjects non-financial criteria into the assessment of its performance) [41]; [59]. An advantage of this method is motivating private initiatives to acknowledge the non-monetary objectives within their projects and PPPs [41]. In 2021, Gillan, Koch and Starks determined that companies' ESG/CSR initiatives are highly related to its markets, industries, geographical location, governance (leadership and ownership), resilience to systematic risk and shareholders value [58]; [59]. They found that green companies, in general, have lower costs of capital associated, being more attractive to invest, and most companies with good financial performance or managerial practices positively correlate to companies with higher ESG/CSR scores [58]; [59]. But, they also discovered some mixed conclusions about stakeholders' gender, conditions and other company based data (such as, market-value) in the implementation of ESG and CSR methodologies to contribute with strategies towards environmental and social welfare, underpinning the necessity for further investigation on these topics [58]; [59]. It was found that integrating ESG criteria and scores in the company's projects or PPPs can support the decision-making, planning and development processes of alternative and long-term sustainable pathways with a strategic thinking mindset [60]. Environmental, social and governance issues must be integrated in the private initiative's strategic values, vision and mission: "the most powerful way to integrate social innovation and economic value is through a company's strategy." (Porter et al., 2019, page 8) [61]

A critic to ESG cites the fact of these providers (Bloomberg, KLD, etc.) to still being relatively recent, which advises caution when assessing correlations between socially responsible and conventional investments of not so large ESG databases [41]. As time goes by, these evaluations must be redone, as there is more data that can defend or neglect the correlations found in the literature described above [41]. There is an undeniable increase of interest in the application of these methodologies, as noted in the increase from 20%, in 2011, to 86%, in 2018, of companies in the S&P 500 index that provide public sustainability reports [58].

Thirdly, EU Sustainable Taxonomy is crucial to the comprehension of the SEA process as a driver for innovation towards sustainability, allowing the practitioner to distinguish from what is hardly recognised as a strategic or non-strategic business/investment plan and to formulate a common language that clearly defines what are sustainable economic activities [25]; [6]; [62]; [63]. It came as a natural evolution to a majority of ideas agreed in the Paris Agreement, in December of 2015 [62]. Moreover, these tools contributed to integrate environmental issues in decision-making of the firm's cost of capital, at the project-level, for example, new investment programmes in infrastructure, or at the firm-level, strategic evaluation of the company's sales and expenses [26]; [64].

EU Taxonomy is very important to regulate and be an incentive for companies to start questioning their real impact and changing the life cycles of their products and services so that they are increasingly sustainable [6]; [64]. This taxonomy for sustainable investments affects heavily the environmental and social impacts derived from decision-making, planning and development processes of projects and PPPs, defining strategies that do no harm in the natural and social systems [63]. This tool came to complement EIA and SEA approaches (traditional and strategic), by supporting the sustainable development practices mainly focused in biodiversity loss, climate change and water scarcity [63]. Similar taxonomy instruments are being developed in other geographies (for instance, Japan, India and South Africa), being the EU Sustainable Taxonomy the most discussed one in the topic of sustainable finance [63]. European Union predicts that this tool helps private initiatives and investors to develop strategic transition plans that target sustainable development [63].

According to the European Commission [6]; [64], EU Sustainable Taxonomy was the first idea from EU to create an unified classification system and IT tool (the Taxonomy Compass), in order to comply with the climate and energy targets for Agenda 2030 and reach the objectives of the European green deal (introduced in December of 2019). Latest worldwide phenomena, as the COVID-19 pandemic and other conflicts, reinforced the need to think more strategically regarding sustainable plans or programmes. This allowed economies, businesses and societies to be less dependent of non-renewable energies and parsimonious social systems, but more resilient against climate and environmental shocks.

There is a fundamental necessity to improve the permanent IT platforms and screening criteria to address this instrument (formulated by academia, business, finance and other additional experts and international bodies). The Technical Expert Group (TEG), which advises sustainable finance within Europe, should improve the EU Sustainable Taxonomy usability and scope (activities that comply with settled sustainable objectives; activities that do not significantly harm the environment; and activities that are neutral all around towards sustainability) [6]; [62]. TEG published its report on 9th of March 2020, supplemented by an annex, containing an updated methodology chapter, and excel sheets, explaining how to approach the EU Sustainable Taxonomy to their own PPPs, suggesting the design of screening criteria and a guide to lead private initiatives towards the use and disclosure of sustainable activities [6]. Their collaborative/participatory governance practices were advised by public consultation and feedback from all stakeholders involved [6]; [62].

The Taxonomy Regulation (published in the Official Journal of the European Union on 22nd of June 2020 and entered into force on 12th of July 2020) set out pillars to the EU Sustainable Taxonomy. Four factors defined and exemplified what a project has to achieve to qualify under the name of environmentally sustainable. To secure their investments, protect their private funds and different types of associations or NGOs from green-washing and to help companies to be more climate-friendly, among other benefits, the regulation addressed every single one of these subjects [6]. Investors are increas-

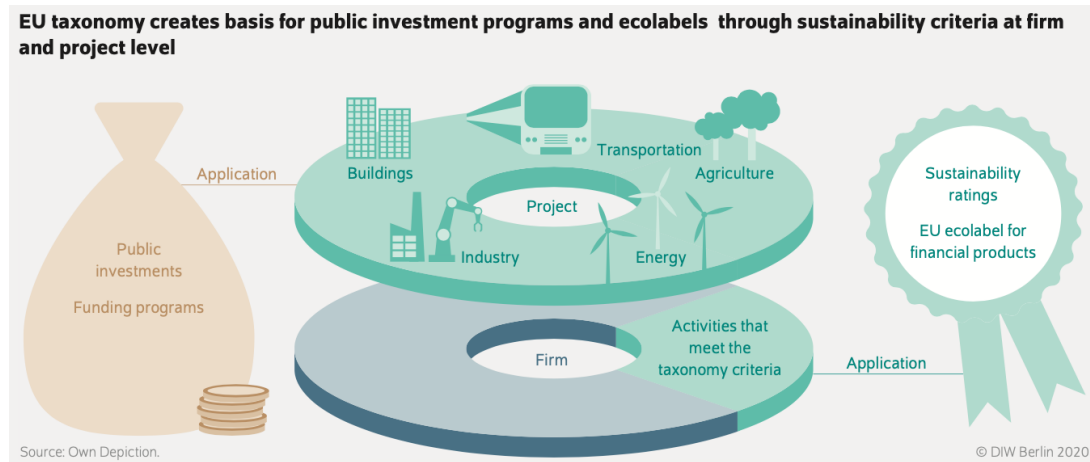
ing their interest in the EU's Action Plans for Financing Sustainable Growth and the European Fund for Strategic Investments (EFSI), that permits long-term strategic investments in projects with growth and labor market potential [64].

The six environmental objectives that subscribe economic activities and substantially contribute to sustainability are: climate change mitigation (reducing greenhouse gas emissions, for example); climate change adaptation; sustainable use and protection of water and marine resources; transition to a circular economy; pollution prevention and control; protection and restoration of biodiversity and ecosystems [6]; [63]. Through delegated acts, a list of screening criteria was posted for each sustainable goal previously enumerated, the first one approved on 21st of April 2021 and formally adopted on 4th of June 2021 for scrutiny by the co-legislators, clarifying that several pathways are required to significantly contribute to each objective [6]; [63]. More acts and commissions are expected to be published and created during 2022 to address more of the objectives proposed and delivering key inputs on how to finance the transition to strategic sustainable thinking [6]. Recently, in 2nd of February 2022, a Complementary Climate Delegated Act nominated, under strict reasoning, certain nuclear and gas energy activities as belonging in the list mentioned above. This covered the EU Sustainable Taxonomy and the criteria associated to the EU green deal, looking to speed up the change from non-renewable energy towards a climate-neutral future (the ultimate objective for 2050) [6]; [64].

Critics to this instrument are that it is mainly a regulation to evaluate if company's initiatives are sustainable or not, only incentivizing them to change their mindsets, rules and business procedures when decisioning, planning and developing projects or PPPs. Its application is solely done to big-sized companies, not start-ups or small-medium enterprises (despite the belief that big companies taxonomy disclosure will motivate other companies to inform and strategize their sustainable practices and life-cycles) [6]. More, there is the necessity to develop technical, scientific, human, organizational and institutional capacities for the correct utilization of this recent tool [63].

According to Schutz et al., in 2020, [64], the EU Sustainable Taxonomy (Figure 2.8) is a classification system to standardize climate-friendly economic activities (global blueprint criteria), with the biggest transparency possible. Economic activities are divided in three categories, green activities (contribute highly to one of the environmental objectives mentioned before), enabling activities (do not harm any other environmental objectives) and transition activities (ask for major efforts to become climate neutral and allows for minimal social care). However, this tool is not universally applied to all sectors of activities, as the strict thresholds established to categorize sustainability are context-specific. They work, for example, to the automotive sector, but the composed standardized criteria does not work in emission-intensive raw material producers, such as, mining or agriculture, where objectives must be readjusted. Innovative thresholds are crucial to make them sufficient into avoiding carbon lock-in (entrenchment of prejudicial practices for too long), but motivating new technologies and investment for existing assets.

More, the EU's Sustainable Taxonomy is compatible with the goal of EU climate neutrality by 2050 and the Agenda 2030 Sustainable Development Goals.



**Figure 2.8:** EU Sustainable Taxonomy Scope (source: [6])

Being said, this chapter concerns to comprehend how investment and financial funds can be a key to enable sustainable activities [62]. Therefore, allows channeling and allocating resources (money, materials, etc.), according to the accurate classification, certification, disclosure and measurement of a company, as environmentally and socially sustainable, i.e., certified as “EU Taxonomy-aligned” [62].

Basically, Sustainability Assessment, ESG and EU Sustainable Taxonomy techniques enhance the relevancy to set long-term objectives for the decision-making, planning and development processes of projects and PPPs [28]. This time extension permits the ecological, social and economical dimensions to converge [28]. In the short term, there are quick wins from these instruments’ implementation that are driven by political pressures and, in that sense, need to be addressed and reported [28].

There is a central message enhancing the importance of business innovation (through new processes, products and technology, redesign of existing materials and renewable energy sources, and investment in R&D) as a fundamental element to achieve sustainability and influencing policy-makers [62]. The strategic decision-making process from companies can be affected by the business model innovations, endured through the EU Sustainable Taxonomy detailed criteria, for determining whether an economic activity is environmentally sustainable, or not, and should, or not, be subject of sustainable financing [62].

In the private sector, Sustainability Assessment tools had to consider the costly trade-off between profit, sustainability and the project’s legal requirements [19]. The SDGs, mainly owned by the governments and the national legislation built around it, are awakening private strategies of what to do to uplift the Earth’s environmental and social conditions, as observed in very recent but sparse literature relating to the theme. In a long-term temporal horizon, the SDGs enhance innovative practices through

cooperation and integration of every single person perspective, enlarging the scope of the instruments mentioned previously (more qualitative and applied at a cross-sectoral level) [19]. Consistent communication, in the form of published universal taxonomy and international standards, are expected to be set, alluding to a general understanding of the issue of concern (SEA strategic approach to achieve the SDGs) and the appropriate ways to comply to it [19]. The SDGs formulation clarified the universal end-goals of sustainability that every activity should acknowledge, amplifying the relevance of learning and sharing, and openly engaging, being accountable and participative [19].

Today, Sustainability Assessment instruments are still not commonplace to support the attainment of the SDGs [19], being this inevitable fact one of the main reasons for this dissertation.



# 3

## Methodology

### Contents

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3.1 Questionnaire . . . . .	36
3.2 Case-Studies . . . . .	37

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This chapter is about the methodology followed in this dissertation, which includes case-studies analysis and a questionnaire.

These methods, alongside discussion groups or interviews, were used in some examples of application of the SEA strategic thinking approach before [40]; [26]. However, in the absence of universally accepted best-in-class methods to this type of investigation, its previous utilization motivated the application of the same methodologies in this dissertation.

Using different methods, each with its strengths and weaknesses, help to aggregate quantitative and qualitative results, and to complement the information delivered by several geographical locations [65].

Important to mention, it will be investigated the use of the SEA process to achieve the SDGs within business strategies and entrepreneurial initiatives, not as an EIA-enlarged project, but promoting environmentally and socially robust decision-making that ultimately influence planning and development processes (as defined in the research questions and hypothesis from the chapter 1). SEA's implementations as a Strategic Thinking instrument is not the same as an add-on report to the plan. It considers the attitudes, criteria and behaviours that include environmental, social and economical reasoning into the different phases of preparation of PPPs or projects [15].

To the creation of the questionnaire, sent to a large spectrum of businesses' stakeholders and entrepreneurial initiatives, there was inspiration from the questionnaire formulated by Partidário and Monteiro, in 2019 [26]. It was also included details from the objectives, hypothesis and motivations of this dissertation.

To the case-studies analysis, it was considered the best practice guide from Partidário, 2012 [3], where it was described extensively the road-map (Figure 2.5), that depicts the process intrinsic to the ST4S framework set as a basis to this dissertation (Figure 2.3). Through the websites and information shared by the employees from the companies that were investigated (at a national level: REN and Galp Energia; at an international level: Shell Public Limited Company (PLC) and Hydro-Québec), it was analysed each step practiced by these companies towards the development of their SBUs and their respective projects, strategically and sustainability wise. From the businesses approaches to sustainability, Environmental and Social Reports, Monitoring Indicators of performance, Strategic and/or Sustainable plans, programmes and policies, it was evaluated how their strategic thinking tools influenced the attainment of the SDGs.

Note that the strict and reduced time-frame to perform this investigation had a crucial role to the methods used to generate data (analytical and argumentative). Rather than going through a lengthy process of SEA application within companies and start-ups to evaluate their influence to attain the SDGs, it was tested the instruments and Critical Decision Factors (CDFs) identified by these entities in previous implementations and strategic/sustainability reports. These are recognized by explicit mention of core conditions that supported these companies (i.e., case-studies) or consultants (i.e., responses to the

questionnaire) to solve environmental, social, economical, political and institutional concerns.

### 3.1 Questionnaire

As mentioned in the paper from Cashmore and Axelsson, in 2013 [66], the appropriate use of SEA to carry strategic decisions between alternative future scenarios is sustained by social constructs. Having this in consideration, this questionnaire (participatory approach to massively gather analytical knowledge between all the sub-samples of analysis and about the main topics of concern) was built with direct/close-ended questions, but also with constructive/open-ended text statements. Each individual perception and observation of the SEA process triggers opinions and points of view completely different and/or complementary [26]. The full questionnaire is available in the Appendix A.

Starting with a proper disclosure of the research and topics involved, the questionnaire is structured between three sub-samples of investigation: Private companies and their business strategies; start-ups/entrepreneurial initiatives; and out-of-sample organisations (NGOs, municipalities, etc.). Therefore, it will be easier to adequately trace the findings between sub-samples, ensuring that the differences of perspectives are highlighted. Convergence and divergence of results will allow to understand how future research should be conducted and focused.

This web-based questionnaire, formulated in Google Forms, was distributed online by a network of contacts gathered in Linked-In, email and three F's (family, friends and fools). There was no time limitation to answer the questionnaire and anonymity was guaranteed. Increased versatility and accessibility are clear advantages of this research method to the respondents, just as reduced costs of formulation and time adaptability to answer. From private companies, as REN, Philip Morris, Swarovski, Galp, etc., to start-ups, for example, Trash4Goods and Lynxai, it was shared among people totally knowledgeable about good managerial and sustainable practices promoted today (including SEA consultants, experts, advisors, project managers and administrators) [26]. 72 stakeholders were questioned, but also two/three collaborators from REN (that know about the SEA projects within the company pipeline), one co-founder from Lynxai and one SEA consultant from Galp were interviewed, aside some other stakeholders from companies and start-ups that helped to gather information, such as, Trash4Goods, Hovione, CTT and Makro (which served as complement to the anonymous ideas shared in the questionnaire results). These interviews were done previously to the questionnaire sharing (mid-March). The final objective of this interviews were not only to get unbiased insights about the topic but also to get access to more information about these private initiatives (reports, projects, among others).

Besides the introductory questions referred above, this questionnaire comprises ten questions that set the context and characterize the sample of the research.

Next, it begins with the respondents' backgrounds and job-roles. Then, focuses on specific SEA

questions to assess how much each person knows about this methodology and its criteria, difficulties and barriers of application to business strategies/entrepreneurial activities. After, the questionnaire presents other sustainability assessment instruments that might be applied to certain enterprises, as the EU Sustainable Taxonomy and the ESG Criteria and scores, in order to evaluate sustainable development in the form of the SDGs.

Obviously, this general overview of the questions are adapted to each sub-sample. In the companies section, it contains costs perceptions and administrative reactions to the general public interventions in the process. In the start-ups section, it is searched for in-depth understanding of how sustainability, in a global perspective, is considered in a newborn business (Business Model and Business Plan formulations). In the out-of-sample section, the diffused analysis of other sustainability assessment instruments is put aside, only centralizing the research in the most relevant tools of analysis (the SEA process and the SDGs). The partial, but existent, focus on EU Sustainable Taxonomy and ESG Criteria is studied assuming that for private initiatives (companies or start-ups) the investment side of business has a similar (or, in most cases, larger) importance than environmental and social responsibilities alone.

Summing, the quantitative closed-ended questions enable a graphical analysis. It accurately measures the causal relations, insights and human judgements of the situation but does not address the complexity of the previous dimensions related to the main topic in discussion [65]; [67]. The qualitative open-ended questions allow space for interpretation of personal contexts and understandings from different experiences, that create unique stories and perceptions of each individual [65]; [67].

## 3.2 Case-Studies

As stated previously, the literature related to Strategic Environmental Assessment is rich on case-studies analysis. However, the way they are analyzed varies from author to author.

In favour of case-studies analysis, it is cited: high conceptual validity; context and process description; phenomenon explanation and understanding of its causes and effects; possibility to foster new research questions and hypothesis. Among its critics, it can be noted the selective bias of what is presented with larger or less relevance and unknown statistical significance [68].

Case-studies can be included in three categories: exploratory, descriptive and explanatory [69]. Zainal, in 2007, page 3 [69], states: "exploratory case studies set to explore any phenomenon in the data which serves as a point of interest to the researcher"; "descriptive case studies set to describe the natural phenomena which occur within the data in question, for instance, what different strategies are used by a reader and how the reader use them"; and "explanatory case studies examine the data closely both at a surface and deep level in order to explain the phenomena in the data".

The case studies in this dissertation are analyzed under an explanatory approach, since it is searched

for proof of the, implicit or explicit, implementation of a SEA process (strategic and/or traditional) to attain Sustainable Development Goals, across all the information available in the company's official reports, plans and websites. Methodologically speaking, as shown in the best practice guide from Partidário, 2012, [3], it is searched if the chosen case-studies utilize the road-map for implementation of a strategic approach to assess how a company moves towards sustainable development (Figure 2.5).

Firstly, it is fundamental to define how to start, which means, what are the key decision problems, objects of assessment or Strategic Issues (SI) that will be address by each project of each company analyzed (REN, Galp Energia, Shell PLC and Hydro-Québec) [3]. These key decision problems or objects of assessment should come in the form of environmental, social and economical issues (ESI) set by the company in their strategic/sustainability plans for the present and medium-to-long term [3]. In this sense, it is very important that the SEA instrument is considered in the beginning, keeping track of the root pillars that sustain any policy, plan, programme or project [3]. Moreover, they should refer to the driving and constraining forces that are being exerted by the participation of other stakeholders (internal, for example, the planners and project managers, and/or external, such as the surrounding communities) [3].

After, define priorities using a number of frameworks, for instance, problem (strategic topics that reflect the context), governance (what are the executive bodies or committees responsible for implementation of the PPPs) and/or strategic reference (macro-environment policies and regulations that influence the company's long-term planning and development processes, for example, ISO) [3]. An usual error is to provide too much detail in these stages, transforming a simple diagnosis in a complicated baseline [3]. Collaborating with stakeholders is mandatory to identify the decision windows and the social constructs that will characterize the relevancy and integration of the different alternatives [3].

Thirdly, Trend and SWOT analysis help to highlight the relevant issues that are linking the sustainable activities of the company and its competitors to its decision-making regarding new projects or PPPs [3]. Dynamic trend analysis is data aggregated to uncover patterns for change and what are the main drivers that influence the evolution to that desired scenario or plausible future [3]. Both of these methods tackle the high uncertainty and complexity that surround strategic thinking methodologies [3]. They must promote a shared vision and knowledge amongst all the agents of change, who should be kept informed of the implementations approved [3]. Finally, companies must assess, according to the critical decision factors adjacent to the project or PPP, the strategic options that help to choose the most beneficial pathways for sustainability. [3]

A final report must be written, where the private initiative's approach to this subject is carefully described, and a network of other models, such as, project-EIA, sustainability assessment or ESG scores, complement the SEA process to solidify the research and results presented to the stakeholders [3].

Sustainability appraisal instruments are just that - appraisal. In contrast, the EU Sustainable Taxon-

omy is only a classification system (and an incomplete one, because it incorporates a limited numbers of economical activities) to prevent green-washing, whilst useful to compare investments based on specific criteria mentioned in the literature review chapter. It is going to be researched how these instruments are mixed with the explicit or implicit uses of the strategic approaches to the SEA (for example, the ST4S methodology).

Next, it is presented the company's basic information, allowing for a better understanding and characterization of the case-studies.

### **3.2.1 Redes Energéticas Nacionais (REN)**

REN is a Portuguese company founded in 2000 and based in Lisbon. It is responsible for energy distribution and infrastructures that cover the national territory, i.e., for the global management of the National Electric System and the National Natural Gas System. They provide a low-cost energy source in the most safe and efficient way possible [13].

This company is known for a high quality service with an above average performance level, being recognized by several prizes, for example, the Gold Standard and the Best Annual Report [13]. REN has strategic partnerships in Europe and other international markets [13]. A main goal of the company is to keep track of the major technological and environmental challenges that resurge everyday by innovating processes and solutions [13].

According to REN [13], they are members of the European market of energy, investing consistently in R&D and Procurement. In this company, SEA processes were fundamental to decide on the geographical distribution of the energetic system network (energy lines and stations) - use of the Environmental Reports and the Non-Technical Summaries of PDIRT 2022-2031 and PDIRG 2022-2031, Environmental Statements of PDIRT 2022-2031 and PDIRG 2022-2031, and Environmental Assessment and Control Reports to perform a deep dive on how REN implements these development and investment plans/projects with a strategic thinking baseline to achieve sustainable development. There were a lot of strategic options, but these methodologies narrowed down the alternatives to a definitive solution with the help of public consultation programmes. The company's strategic values and mission are: sustainable development, new business models, business quality and continuity, and digital/smart networks and operations [13]. These are based on an innovative culture spread by a three-way communication between employees, top management and external stakeholders [13].

In the end, it is essential to acknowledge the fact that REN is a multidisciplinary company, acting in other industries and/or companies, such as, telecommunications (RENTELECOM) and renewable energies (Enondas - Energia das Ondas, S.A.) [13]. Their commitment - act4Nature - enhances their role as the main agent to the national energy management, guided under rigorous and measurable sustainability criteria and excellence practices, ensuring harmonizing relationships with the community

and environment surrounding [13].

### **3.2.2 Galp Energia**

With more than 100 years of existence, Galp produces oil and natural gas, refines oil derivative-products, distributes and commercializes electricity [8]. It has a global presence (Portugal, North Africa, Brazil, etc.) and operates in the areas of Upstream (production and/or extraction), Industrial & Energy Management (energy efficiency and value chain management), Commercial (gas stations geographical distribution) and New Business/Renewable Energy (innovative solutions) [8].

According to Galp, in 2022 [8], the primary objective is to find profitable, efficient and sustainable energetic solutions. Next, the strategy must ensure a robust Return on Investment (ROI) and promote an appropriate energetic transition that does not damage the shareholders' returns.

The Agenda 2030 and the Sustainable Development Goals are kept in mind in the company's decarbonization and electrification processes, with strategic partnerships settled with low-carbon emission suppliers [8]. Galp pushes for a healthy and learning environment between managers, clients, employees and young talents, trusting and empowering them to innovate and work autonomously [8].

Galp has practiced CSR initiatives, such as, facilitating and encouraging the access of education to new generations, helping communities in social emergencies and protecting biodiversity, in the form of species and ecosystems [8]. The recognition of these attitudes and behaviours was, for instance, the Gold company by EcoVadis. One concern of the company is the complexity and uncertainty of the regulations in the energy sector nowadays [8]. Galp's report on Non-financial information 2021 - Task-force on Climate-related Financial Disclosures (TCFD) Recommendations -, describes the project that is subject to the SEA process: the conversion of Sines' refinery into an ecological energy park [8]. Previously, Galp has shared reports stating how they used EIA and effects-based SEA to identify the impacts, on the environment and surrounding communities, of installing this infrastructure [8].

Galp ambitions to be a company known by its ESG scores and zero liquid emissions of CO2 by 2050 [8].

### **3.2.3 Shell PLC**

Shell PLC is a multinational company, founded in 1907 [9]. It is spread world-wide, with presence in the African, American, Asian, European and Middle Eastern markets [9]. Its expertise covers exploration, production, refination and marketing of oil and natural gas [9]. As Galp Energia, their Strategic Business Units include Upstream, Integrated Gas, Renewable and Energy Solutions (formerly New Energies), Projects & Technology, and Downstream [9].

Innovation, research, investment and development of new Information Technology (IT) fall within the



core business of the company, with the final objectives of developing a circular supply-chain that respects nature, reduces waste, is financially resilient and distributes regular dividends to the shareholders [9].

One of the main pillars of the current Shell's strategy is to use renewable energy in the center of any service that is made available to the general public and B2B clients, for example, low-carbon energy sources (wind, geothermal, solar, etc.) and transportation sourced by new fuels (advanced bio-fuels and hydrogen) [9]. Other pillars of Shell's vision relate to the transparency, ethics and safety of the projects undertaken by the company [9].

According to Shell, in 2022 [9], the respect for workers' diversity and well-being are fundamental to Shell's performance. Inclusion, sense of belonging and equitable treatment are current trends of good managerial practices that Shell is implementing. Other facts that sustain Shell's ambition to build upon sustainable development are: \$94 million were spent on voluntary social investment worldwide in 2021; net-zero emissions goal for 2050 in order to fight SDG 13 - Climate Action; and helping to limit the rise in average global temperature to 1.5° Celsius. [9]. Shell has used and recognized the utility of the strategic SEA instrument to explore and build large projects (for example, the oil and gas pipelines in the area of the Sakhalin Islands) [70]. They have also used EIA and effects-based SEA methodologies to other extractive projects (with the end-result of implementing specific policies to achieve targets and indicators of the SDGs, as it is mentioned in Shell's, strategic and corporate, Sustainability Report 2021) [70].

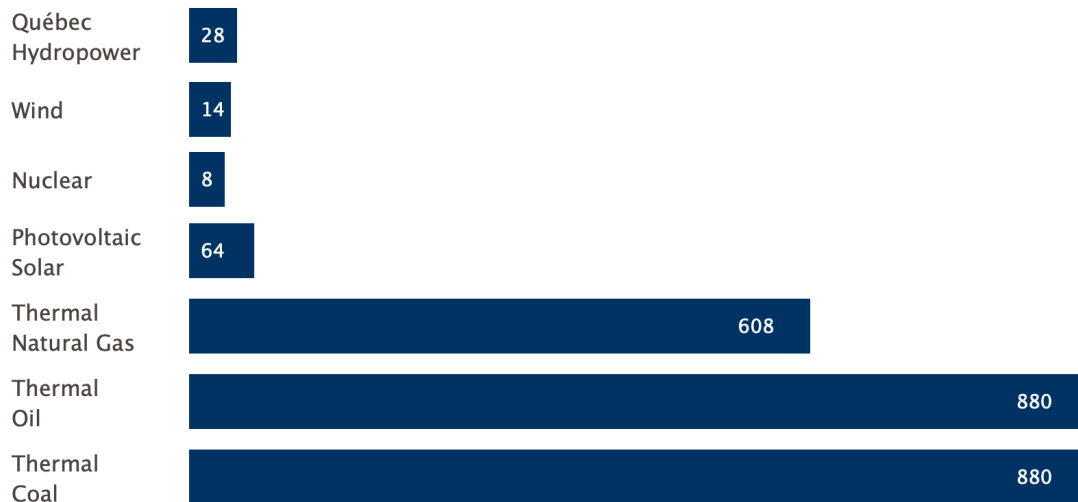
### **3.2.4 Hydro-Québec**

Hydro-Québec has been energetically sourcing Canada's largest region for the last 75 years. This company supplies electricity with clean and renewable energy sources that are key to the development of a greener economy [7]. Its mission is to provide competitive prices to the market and contribute to the wealth of the region [7]. Hydro-Québec shared a large amount of corporate documents (the 2021 Annual Report, the 2022-2026 Strategic Plan, the 2021 Sustainability Report and the 2020-2024 Sustainable Development Plan) that are the main points of dialogue and participation of the internal and external consultants and environmental authorities that aid in the planning, decision-making and development processes of Hydro's mega-projects for the construction of dams to produce energy [7]. Combined with the company's values of inclusion, innovation and courage, the vision of this company is to provide an energetic service with high-quality and safety [71].

The main Strategic Business Units from this company are: Generation (through hydroelectric generating stations), Transmission (using high-voltage lines), Distribution, and Equipment & Innovation (investments in technological breakthroughs, for example, safe battery materials and energy storage systems) [7].

Finally, Figure 3.1 show the greenhouse gas emissions estimates (gCO<sub>2</sub> eq./kWh). This points out the significant reduction since 1990, by dropping 75% to date (the Kyoto Protocol reference year), based

on LCA [14]. Hydro-Québec has a customer and results-driven corporate culture, building hydroelectric generating stations that operate for over 100 years (contrarily to the thermal and wind equipment that last on average 25 to 30 years) [7].



**Figure 3.1:** GHG Emission Estimates – Power Generation Options Based on Life-cycle Analysis (gCO2 eq./kWh) (source: [7])

In 2021, the company was once again acknowledged for its sustainable practices: the EcoVadis Platinum medal and the Excellence Canada Platinum Award, recognizing formidable action in the fields of governance, strategy, customer experience, employee wellness and innovation [14]. Strategic approaches for sustainability and cumulative effects assessments were used by Hydro-Québec for the case-study of James Bay: extensive hydroelectric dam project that was built with the assumption of ensuring proper territorial planning, in order for the surrounding communities and indigenous people not to be affected negatively by this infrastructure [72].

# 4

## Results & Discussion

### Contents

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4.1 Questionnaire . . . . .	45
4.2 Case-Studies . . . . .	52
4.3 Discussion . . . . .	62

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In this section, results and discussions are presented according to the methodology described in the previous chapter.

The questionnaire's results start with the sample characterization. Then, the quantitative and qualitative considerations are enumerated to infer insights about the role of Strategic Environmental Assessment in the achievement of Sustainable Development Goals within business strategies and entrepreneurial initiatives. As explained before, two sub-samples, private companies and start-ups, can drive divergent and overall distinctive arguments that should be discussed independently. EU Sustainable Taxonomy, Business Model innovations and other relevant strategic instruments are evaluated to prove its efficacy, completeness and adequacy to the main objective of this research.

For the analysis of the case-studies, the road-map presented in the Figure 2.5 is the basis for discussion. To accommodate this information in a concrete setting, the previous chapter presented and contextualized each company. In the companies' reports, it is identified and prioritized the critical decision factors that help to improve and decide on the sustainability outcomes or ways of working of the specific projects or PPPs. Stakeholders' engagement, through dialogues and recommendations, is considered and used to complement the employees implementations. These culminate in the identification of trends, opportunities, threats, strengths and weaknesses, which can define the most probable strategic pathway of the company to develop sustainable programmes towards the attainment of the SDGs.

## 4.1 Questionnaire

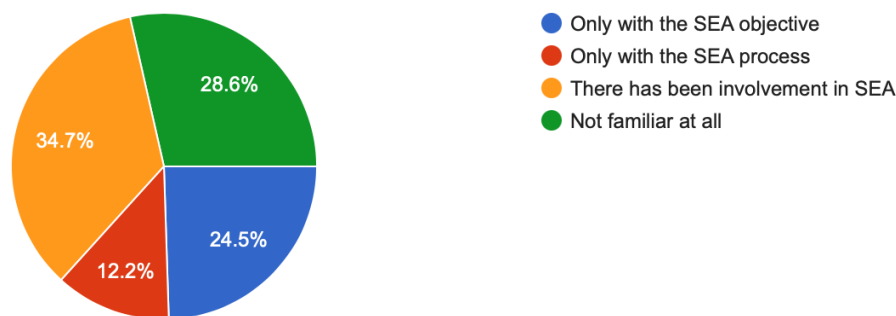
About the questionnaire, it was gathered a total of 72 responses, with all of them accepting to willingly participate in this research (i.e., acknowledging the purpose of the study and the researcher's availability to clarify doubts about the topic). From this sample, 68,1% (49 respondents) are represented by private companies' stakeholders, 22,2% (16 respondents) by entrepreneurs and the remaining concerning out-of-scope individuals/entities (for example, NGOs, Non-For-Profit Standard Setting Organizations, topic enthusiasts and freelancers).

In terms of demographic data, 44,4% of the respondents are between 35 and 50 years of age, 34,7% between 25 and 35, and 13,9% between 18 and 25 years old. There is an almost 50/50 gender proportion (male/female), with a noted predominance of Caucasian respondents (81,9%). 90,3% of the individuals surveyed live in Europe and 79,2% are master's graduates (9,7% graduated with a bachelor's degree). 34,7% of the sample is catholic and other third is either atheist, 19,4%, or agnostic, 15,3% (22,2% of the respondents avoided this question, in their right). 93,1% of the respondents speak English, 73,6% speak Portuguese, 45,8% speak Spanish and 13,9% speak french. There are also a minority of Danish, German, Turkish and Italian native speakers. Lastly, 90,3% of the respondents are full-time

employees, more than 60% are Portuguese, 25% collect between 15.000€ and 30.000€ annually from their jobs, 16,7% between 50.000€ and 100.000€, 13,9% more than 100.000€ and 12,5% between 30.000€ and 50.000€.

Starting with the private companies section of the questionnaire, there is an initial deepened characterization of the respondents, where it was found that 53,1% of the respondents are entitled with a manager position in their respective companies. The other three most relevant positions are internal consultant with 18,4%, expert with 16,3% and general administration with 6,1%. The field of expertise from our sample was in majority covered by sustainability domain experts (79,6% that equals to 39 respondents), followed by economics and/or management (18,4% that equals to 9 respondents), engineering (14,3% that equals to 7 respondents) and the combination of project management, procurement, process design and planning (20,4% that equals to 10 respondents).

Entering the subject matter of this dissertation, it is understood that 34,7% of the respondents admit being familiar and had been involved with the SEA process. However, 28,6% of the respondents are not familiar with this instrument at all. In the third place, 24,5% of the sub-sample state they are aware with the SEA objective and the remaining answers acknowledge the SEA overall process, as shown in Figure 4.1.



**Figure 4.1:** How familiar are you and your company with the Strategic Environmental Assessment (SEA) instrument?

Interesting to note that, in the next question, 48,9% of the respondents refer that their company do not apply SEA. The ones that do, present the project and planning managers (28,6%, 14 respondents), the project team & advisors (22,4%, 11 respondents) and the SEA consultants (12,2%, 6 respondents), as the responsible agents of change (SEA process implementation). When asked to identify explicit case-studies of SEA application in their company’s strategic projects to achieve sustainable development, some mentioned examples were sustainable procurement processes for products and services, capital investment maturation processes, solar panels and water treatment energy plants installation, risk assessment and management, certified environmental management systems, plan for a touristic

village project, among others. According to the cases where there was application, majority agrees (more than 50,0% of the respondents with a score of 4 (Agree) or 5 (Totally Agree) in a Likert scale, excluding respondents that "do not know" about the concerning question) that SEA: allows the integration of environmental and/or social information to project's and PPPs' development processes (82,4%); helps the establishment of priorities early-on the process (72,7%); contributes to the discussion and definition of strategic options of development (78,8%); contributes to alter the vision of the plan mid/long term (52,9%); helps the planning team in learning and innovating processes (58,1%); has a fundamental role to the attainment of the SDGs in the company (56,3%); produces information that was used by planners in the review and discussion of changes (69,7%); and allows to alter decision-makers mindsets and vision in relation to future developments (62,5%). But do not agree entirely that SEA promotes the engagement and contribution of the public and other sectorial entities (48,5%), and has a fundamental role to obtain sustainable investments in the company (45,5%). To sum up, the impediments stated by private companies for this instrument to flourish in the attainment of Sustainable Development Goals are, in order of importance, clarity of the legislation (46,9%), planning practices to integrate SEA (34,7%), collaboration between entities for decision-making and motivation of entities to enhance SEA (32,7%), SEA guidance useful and sufficient (24,5%), capacity of the public to contribute to SEA (22,4%), concept and utility are not known in the private sector and resources might be non-existent (2%). 71,3% of the respondents agree that a Strategic Environmental Assessment process benefits outweighs its costs.

To research additional areas of involvement to this dissertation, it was explored the companies' knowledge about Sustainable Finance. 73,5% of the respondents mention overall acknowledgement about ESG criteria and scores. 20,4% admit they recognize the EU Sustainable Taxonomy and responsible investments perspective of planning business strategies to achieve sustainability. From the overall sub-sample, a not convincing 40,8% proportion of the respondents consider that his/her company took successful advantage of Sustainable Finance. This is supported by a general opinion that the tools provided by the competent authorities (excel sheets, Taxonomy Compass, ESG surveys, etc.) are complex and difficult to new practitioners, illogical between concepts of activities' classifications, inflexible between different SBUs and criteria to evaluate, not very user friendly and universally accepted due to lack of standardization, broad marketing data integration and clarity of use (besides certain statements that these recent tools can be improved, adding to its usability and functionality already existent for new projects, and justifying the time and resources implications to the development of these activities).

Relating to the SDGs, 77,6% of the respondents are highly familiar with it (ranking a score of 5 out of 5 in a Likert Scale). When asked which SDGs are addressed within their companies, there is a common attitude to state several of the goals (or, even sometimes, all of them). After tracking the absolute results, by order of importance, there is a slight relevance given to the SDGs 13 (Climate Action) (mentioned 34 times), 12 (Responsible Consumption and Production) (32 times), 8 (Decent

Work and Economic Growth) (31 times) and 7 (Affordable and Clean Energy) (29 times), supporting recent literature published [50]. The ones with the less significance to the sample taken are the SDGs 2 (Zero Hunger) (13 times), 14 (Life Below Water) and 16 (Peace, Justice and Strong Institutions) (15 times), and 1 (No Poverty) (16 times). Note that there were considerations about the fact that companies should approach the SDGs that indeed correlate the best with their economic sector/industry.

Finally, the instruments that these individuals stated the most as the means to the SDGs attainment were ESG criteria (79,6%), seconded by Strategic Environmental Assessment (22,4%), then Environmental Impact Assessment and EU Sustainable Taxonomy at the same place (20,4%). 89,8% of the answers refer that companies are being successful in the attainment of the proposed SDGs with the use of the instruments stated previously. When asked about the main difficulties, in their opinion, to be successful in the fast and effective attainment of the Sustainable Development Goals, it was highlighted the high costs and lack of budget planning, the funding and bureaucracy to finance these multiple instruments' implementations into long-term business strategies, the scarce incentives, skills, knowledge and human resources engagement to involve and execute the understanding of the topic, how to adequately monitor, measure and evaluate impacts (standardized metrics and guidelines), the KPIs and time to implement initiatives based in sustainable thinking, the linear thinking and indirect correlation between the SDGs attainment and other more practical standards, the SDGs structure into key milestones, targets and indicators that are mainly computed at country level but intangible to company's culture and information practices (only supporting and not entirely guiding continuous improvement, supply chains and product development), the stakeholders and policy-makers resistance to change, the participation in the strategic alignment, purpose, focus and orientation between different SDGs, and the prioritization towards transparent and responsible decision-making or investments. For the respondents, the following aspects were/are crucial to the attainment of the SDGs (more than 50,0% of the respondents with a score of 4 or 5 (Fundamental to the company) in a Likert scale, excluding respondents that "do not know" about the concerning question): administrative/management support (76,1%); stakeholders' involvement in the project's development processes (79,5%); early-on analysis of environmental and social impacts from the proposed plan/project (78,3%); proactive, structured and efficient communication between all internal and external stakeholders (82,6%); motivation to innovate and search for sustainable solutions within the company and its entrepreneurial initiatives (73,9%); having a strategic approach to the company's projects and everyday tasks (69,6%); vision and mission convergence between employees and managers (73,3%); ESG criteria (75,6%), EU Sustainable Taxonomy compliance (54,8%) and SEA practice (51,4%).

About the start-up/entrepreneurial initiatives sub-sample, 50% of the respondents are the (co-)founders of these organizations. The other half represent other type of employees, including consultants and CEOs. Firstly, it was searched if these initiatives considered, from the beginning (i.e., business model



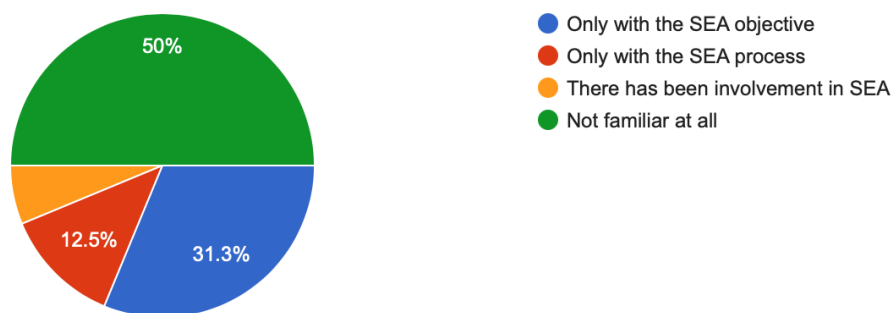
ideation and construction), any sustainable aspects into their business strategies. 68,8% of the entrepreneurs stated they did. How it affected their business and/or investment plans include the following reasons: defining a mission and value proposition statement (for example, promoting sustainability in the financial industry); excluding business models that would incentivize, or even create, negative societal and environmental impacts; participating in impact competitions; establishing impact metrics (for example, in the acquisition and operation of hardware); thinking strategically about revenue streams and costs structure to achieve sustainable development (financial, social and environmental); promoting decent work conditions, remunerations, talent and career development; improving product development and production processes.

When confronted with the possibility of having a block with sustainable considerations within the Business Model Canvas, 37,5% of the respondents admit it is not fundamental, as this instrument should not be to work on sustainability, but in the business model core foundations and initial considerations (if the business audience is not sustainability-focused). It is argued that a Business Model Canvas is not restraining to a start-up operational path, as it can not define final solutions that are traced after some business development. The remaining individuals that appreciated this idea think it can add value because it would help to avoid only looking at making money, to also account for externalities and impacts on all sustainability levels that are not thought of at all (B-Corp certificate, etc.). Moreover, assessing it early in the process can increase the awareness to the SDGs, and assist decision-makers when approving compromising investments that subscribe a strategic plan very costly to abandon or change drastically. They advocate that, at this stage, i.e., business plan and structure definition, entrepreneurs must be aware that sustainability is mandatory in any business.

After, 81,4% of the entrepreneurs surveyed said they would use a tool, already proven in the public sector, to comply with the Sustainable Development Goals. From those, 62,6% of the respondents agree that they would do it early-on in the Business Model Canvas construction, 18,8% defend it would be preferred mid-term when developing the business plan, when escalating the business internationally or right before/after the first investment round (although it would need to be free of charge and allowing to cover one SDG at a time, and not necessarily, all of them at once).

Unfortunately, 50% of the respondents admit they are not familiar with the Strategic Environmental Assessment instrument at all (Figure 4.2). 31,3% state they recognize the SEA objective and 12,5% assert they are familiar with its process. Only one co-founder mentioned involvement in an entrepreneurial SEA activity. It was confirmed that the application of these instruments is responsibility of the team (as they are worried with both social and environmental concerns that impact the organization and would act accordingly, through, preferably, an ESG-type approach).

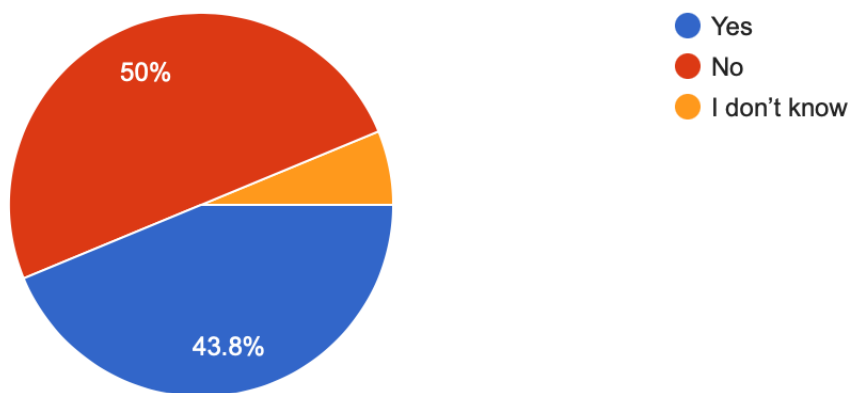
The practical cases enumerated to have applied SEA in an entrepreneurial activity are production processes overall and financing projects with socially and environmentally sustainable value proposi-



**Figure 4.2:** How familiar are you and your team with the Strategic Environmental Assessment (SEA) instrument?

tions. The indisputable SEA advantages that are seen to leverage start-up ecosystems are (more than 50,0% of the respondents with a score of 4 (Agree) or 5 (Totally Agree) in a Likert scale, excluding respondents that "do not know" about the concerning question): helping with the establishment of priorities early-on in the process (66,7%); altering the vision of the plan mid/long-term (55,6%); contributing to the discussion and definition of strategic options of development (66,7%); helping the planning team in learning and innovating processes (66,7%); and having a fundamental role to obtain sustainable finance/investments (62,5%). Concerning this last advantage, 37,5% of the entrepreneurs acknowledge overall familiarity with ESG criteria to sustain Sustainable Finance/Investments. However, 31,3% are not familiar at all with these topics and 25% state they are aware of the EU Sustainable Taxonomy. Easy to confirm the fact that most of the respondents (68,8%) do not have any experience with EU Sustainable Taxonomy Compass and excel tools, as only 25,0% of the entrepreneurs argue these tools are necessary for start-ups to certificate a business/idea as sustainable, attract investors from all areas/sectors and build a path to the European Green Deal. In the other hand, one entrepreneur complained about its ease of use, as they are mainly designed to regulate and inform. There is almost a 50/50 proportion (Figure 4.3) of answers about if the entrepreneurs understand the coverage and possibilities of use of these tools.

Ultimately, 93,8% of the respondents scored at least 4 in a scale of 5 has being familiar with the SDGs. Therefore, it is clear that entrepreneurs recognize the importance of these type of instruments. By order of importance, the ranking of the most important SDGs approached by the entrepreneurial initiatives surveyed are the SDGs 8 (Decent Work and Economic Growth) and 13 (Climate Action) (mentioned 8 times), 9 (Industry, Innovation and Infrastructure) and 11 (Sustainable Cities and Communities) (mentioned 6 times). The SDGs that do not show predominant access to start-ups (mentioned only 2 times) are 2 (Zero Hunger), 14 (Life Below Water) and 15 (Life On Land). The instruments most mentioned to be used to attain the SDGs by the entrepreneurial initiatives are the ESG criteria and scores (50,0%), followed by the EU Sustainable Taxonomy (18,8%) and the SEA process (12,5%). There were



**Figure 4.3:** Are you aware of the possibilities to apply these instruments?

also residual mentions (6,3%), i.e., one respondent, referring the EIA, and another referring. the LCA. In the end, 75% of the start-ups believe they are being successful in the attainment of the proposed SDGs.

Entrepreneurs also defined the main impediments for a start-up to be successful in the attainment of the SDGs (through full-text answers). They are lack of time, financial resources/profitability, employees' skills and knowledge about the topic, lack of measurement and reporting techniques, law and bureaucratic impositions, lack of clarity and explicit ways to address specific issues in order to be able to compare businesses fairly.

Finally, the out-of-scope answers (7 respondents) are not enough to generalize an idea or insight to how Strategic Environmental Assessment helps in the attainment of Sustainable Development Goals. The fundamental purpose of this sub-section in the questionnaire was to include a possibility to eliminate discrimination between respondents and make them acknowledgeable of the topics that are being surveyed in this research. But, just to summarize, from a broad range of consultants (2 individuals), expert, general employee, engineer, administrator and manager, 42,9% acknowledge being involved with a SEA process, and the other respondents are divided by 2 individuals not familiar with it at all, and other 2 aware of the SEA objective. These people state that environmental engineers or sustainability managers are the responsible to apply SEA (for instance, in different projects for NGOs and communities in the Amazon rain-forest, to set the hydro-power industry standard that audit the SEA's process quality, to make decisions and to define policies, plans and programmes). They recognized the following benefits from the use of a SEA process: allowed the integration of environmental and/or social information to the project's development processes; helped the establishment of priorities early-on the process; contributed to alter the vision of the plan mid/long-term; contributed to the discussion of strategic options of development; helped the planning team in learning and innovating processes; and produced information

that was used by planners in the review and discussion of changes. All the respondents know, at least to some extent, about the Sustainable Development Goals, with 5 of them referring they have used/are using EIA to address it (4 use the SEA instrument, 2 the EU Sustainable Taxonomy and 1 the ESG Criteria).

## **4.2 Case-Studies**

For the analysis of the case-studies, it was followed the methodology described in the previous chapter. There, it is presented a step by step explanation on how to apply a ST4S approach to the SEA process in private initiatives. The case-studies analysis shown in the next sub-chapters describe how companies are approaching this methodology in order to comply with the SDGs. They will evidence the synergies and conflicts that appear in the decision-making, planning and development processes of projects or PPPs designed by the companies. In the end, there is a discussion of the Critical Decision Factors that aspire to guide the projects or PPPs to sustainable development.

### **4.2.1 Redes Energéticas Nacionais (REN)**

As defined in the methodology chapter, REN's case-study starts by contextualizing the ST4S approach to SEA within the Investment and Development Plans of Rede Nacional de Transporte (RNT) and Rede Nacional de Transporte de Gás Natural (RNTGN) [13].

First, it is defined the objects of assessment that converge in four key decision problems: internal well-being (related to Occupational Health and Safety (OHS) and workforce motivation, empowerment and skill development); environmental protection (climate change prevention and biodiversity protection); territorial planning and local communities (impacts and consultation to prevent damaging social effects); governance & ethics (rules and codes subject to the company's practices) [13]. To sustain the previous problems identified, REN resumes its approach to sustainability as a continuous source of electricity and natural gas that covers the Portuguese territory, investing strongly in the R&D of renewable energies and following the best environmental and social practices. [13].

Second, REN identified its driving forces: human capital qualifications, by providing appropriate training; measures to generate skills fundamental to performing daily tasks in the safest possible way; dialogue and participation of internal and external stakeholders [13]. Moreover, the company looks to evaluate conditions favourable to retain the best talent available in the energetic sector (SDG 8 - Decent work and economic growth) [13]. Also, REN considered the participation of outside actors, such as, academia or general public. A method to prioritize this issue is based in an initiative founded in 1995 called "Prémio REN" (which is a scientific award that incorporates the most recent R&D investments and innovations in the energetic sector), subscribed in the Investigation, Development and Innovation

certification (SDGs 4, 7, 9 and 11 - Quality education, Affordable and clean energy, Industry, innovation and infrastructure and Sustainable cities and communities). Moreover, the initiative "Prêmio AGIR", awarded by REN, encompasses the commitment to CSR in associations, companies and NGOs with social contexts as matters of concern [13].

REN established the act4Nature commitment, that strategically utilizes and points out the opportunities to be enhanced in the achievement of sustainable development (in terms of electricity and natural gas distribution) (presented in the Appendix B, tables B.2 and B.3). This statement provides alternative solutions that involve the generality of the stakeholders, including workforce, suppliers and service providers, in programmes of energy network distribution design, reforestation, biodiversity protection and climate change preservation (for example, the projects Cátedra REN, Medalhas de Mérito Científico REN - Ciência LP, "Heróis de toda a espécie", MEDEA and "Declaração de Política de Responsabilidade Social") (SDGs 13 and 15 - Climate action and Life on land) [13]. Nevertheless, REN comprehends the relevancy of the SDG 17 - Partnerships for the goals -, which is implicitly inferred from their management principles and certification systems [13].

It is given importance to the surrounding local communities that might be affected by the maintenance of the continuous electricity and natural gas distribution networks in their terrains [13]. This collaborative approach help to choose a sustainable future network, with an active role of the general public (positioning of stations across public territory) [13]. This is supporting evidence of the strategic role that the ST4S approach to SEA plays for REN's business strategies.

REN's sustainability plans are aligned with the 17 SDGs. The norm AA1000APS - Assurance Principle Standards 2008 - and the accreditation by NP 4469-1, helps to prioritize and perform REN's strategic reference frameworks: promotion of internal well-being (foster diversity, inclusion and safety in the workplace, corresponding to the SDGs 5 and 10 - Gender equality and Reduced inequalities); stakeholders participation; environmental protection; governance and ethics (aversion to corruption, appropriate risk management boards and continuous improvement of the decision-making processes to mitigate threats and/or negative outcomes, corresponding to the SDG 16 - Peace, justice and strong institutions) [13].

The benefits from these CDFs considerations are the recovery of deforested areas, cleaning and installing of (sub-)stations according to adequate territorial planning, creating enough space to avoid damaging wildfires and people's privacy/safety [13].

However, to evaluate environmental impacts, Redes Energéticas Nacionais use different instruments dependent on the phase of the project, such as the EIA for the follow-up stage of sustainability assessment [13]. Note that Environmental Impact Assessment is also present, mostly to the public-infrastructure projects, enhancing the value of appropriate monitoring and compensations [13]. How REN communicates and acts with its main stakeholders to reduce constraining forces can be found directly on their website, stating literally their strategic vision to embed any internal or external partner that

must be in tune with their values [13]. To sum up, REN designed and planned a network for the distribution of energy across Portugal, combining the following strategic options: full coverage of the territory with no consideration of territorial specifications and urban planning; and coverage of territory taking into consideration environmental and social protection (with collaboration of surrounding communities and territorial planning experts/governance bodies). The final decision was the second pathway, which allowed, in its fullest, to maximize sustainability (harmony between economical, social and environmental conditions).

#### **4.2.2 Galp Energia**

Galp Energia applies sustainable strategic thinking into all its projects and PPPs, with the final objective of creating a promising future to the next generations [8]. It is a workplace founded in meritocracy, accountability and autonomy, where there is a key message concerning social responsibility and corporate excellence [8]. These are the core decision problems when assessing the implicit ST4S methodologies in the assessment of the extreme natural conditions that can affect an important infrastructure as the Sines refinery (prone to environmental and social disasters, for instance, damage or destruction of storage tanks) [8].

Galp's approach to sustainability can be summarized as implementing a profitable and sustainable business, creating long-term value to the stakeholders, contributing to the international standards established, acting compliant and with ethical reasoning to exceed expectations [8]. Top management is in charge of defining the guidelines and six commitments to sustainability [8]. Besides the ones mentioned above in the approach to sustainability, it is also stated the constant evaluation and transparency of impacts that aid to the decision-making processes [8]. This company has gone through structural transformations in order to accommodate responsible leadership mechanisms to address the main sustainability issues of its sector (the Board of Directors and the Executive Committee strategize on the climate and social enhancement activities, and the Sustainability Committee acts and is accountable for executing these strategies in the decision-making, planning and development phases of each project or PPP) [8]. Ultimately, it is promoted a SWOT analysis to guarantee that the main risks and opportunities are enumerated and appropriately managed [8].

Via formal, periodic and systematic consultations with stakeholders, Galp Energia monitors sustainable development [8]. Furthermore, the company reports the non-financial information, with the economical, environmental and social values produced in a year, by the Global Reporting Initiative (GRI) standards document, the TCFD recommendations and the UN Sustainable Development Goals directives. Galp's materialist matrix is set according to the impact of sustainability into strategy, performance and positioning [8]. The materialist procedure involves four stages: Identification (Trend Analysis and Bench-marking); Internal Evaluation (Alignment of objectives); External Evaluation (stakeholders' con-

sultation); and the Materialist Matrix (positioning of the several perspectives) [8]. The base reference to prioritize potential solutions are the norms AA1000 AccountAbility Principles Standard (AA1000AP 2018) and NP 4469-1:2008, aligned with the ISO 26000:2010 about ESG criteria [8].

The end-result is specifically around certain Sustainable Development Goals (SDGs) that Galp aims to accomplish as a private organization [8]. Basically, these commitments, mainly the ones related to natural gas, management of renewable energy and efficiency, match perfectly to the strategic guidelines that the company describes further on practical case-studies that are found on the website [8].

To formulate policies to attain the SDGs in the company's projects and PPPs, these are the company's norms: settle internal challenges; subscribe external commitments; active network of know-how; continuous improvement, innovation and research (SDG 9 - Industry, innovation and infrastructure); management of safety and health systems; culture of sustainability; training, talent acquisition, inclusion and diversity of the workforce (SDG 8 - Decent work and economic growth); gender equality (SDG 5 - Gender equality, reducing pay gap and representation between men and women working in low and top-management positions); and education access (university partnerships, thesis and internships; SDG 4 - Quality education) [8]. The compliance with the SDGs, in three different blocks (direct, indirect and material), is shown in the Figure 4.4.

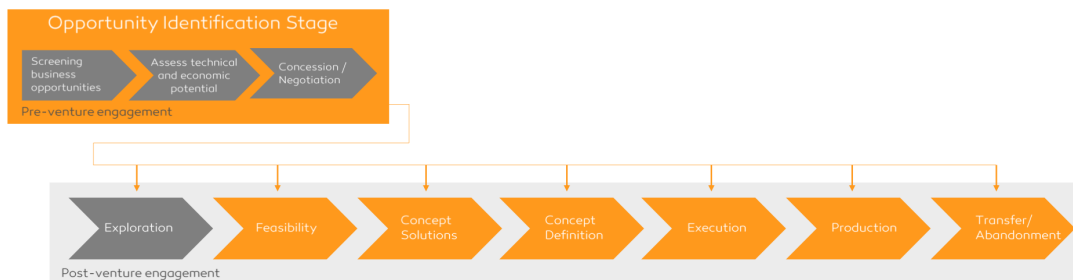


Figure 4.4: Galp's Sustainable Development Goals Business Strategies (source: [8])

In a highly complex and volatile sector, the main critical decision factors considered in the decision-making, planning and development processes of each project or PPP of Galp are: climate change (decarbonization, net-zero emissions and carbon footprint monitoring); R&D investment; innovative and social business models/products/services to unlock the full potential of Galp in this competitive market [8]. Mission-aligned partnerships with sectorial associations (SDG 17 - Partnerships for the goals) scale up

the technology and scientific work developed in-house, ensuring synergies that take the strengths from each partner to benefit the final client and the world itself [8]. All these innovative investments are being allocated to projects that optimize the company’s processes and contribute to sustainability: capturing and using CO2 as a raw material (SDG 13 - Climate Action); optimizing the water residuals coming from Sines refinery; operationalizing eco-efficiency (SDG 6 and 14 - Clean water and sanitation and Life below water); RoadFix Cork (using cork to innovate the refining process) [8]. All these factors are crucial to the evaluation of the strategic options to the location, form of exploitation, execution and operation of Sines refinery: formulating renewable generation portfolios; producing hydrotreated vegetable oil for energy; constructing a desulphurization unit; providing decentralized generation energetic solutions to customers; developing green hydrogen solutions; and/or belonging to the lithium batteries value chain by enduring chemical processing [8].

Periodically reviewing the different scenarios and energetic transition solutions will help to find strategic decision windows to apply practices in favour of Agenda 2030 [8]. The company must understand that its operations have impact in neighboring areas, affecting the cultural heritage and health of local communities (potentially leading to relocation) [8]. In 2021, 2.335 internal and external stakeholders were consulted, through surveys, events and interviews, to review their thoughts about sustainable critical factors and their relevance to the Sines refinery project [8]. Figures 4.5 and 4.6 shows how the Health, Safety, Social and Environment (HSSE) framework is applied in Galp’s projects and how the company performs due diligence with stakeholders.



**Figure 4.5:** Galp’s HSSE Requirements (source: [8])

In conclusion, Galp followed the taxonomy settled by the TCFD (similar to the EU Sustainable Taxonomy) and has the habit to report on the ESG Criteria (as it is mandated by international law). These instruments support the traditional sustainability assessment instruments used (SEA and EIA), mostly with the important mission to converge with the international trends about sustainability practices.

Finally, Galp Energia is also developing explicit environmental and social projects to the attainment of the SDGs, supported by its private non-for-profit organization, Fundação Galp (these can be found in the Appendix B, tables B.4 and B.5) [8].



- Identify, analyse, evaluate and monitor affected communities and the range of stakeholders affected;
- Implement a stakeholder engagement plan throughout all lifecycle and be subject to evaluation of their effectiveness and review of its suitability;
- Provide affected communities, as early as, with access to relevant information;
- Enable affected communities to express their views on operational and project risks, cultural heritage preservation and other environmental and social impacts and mitigation measures;
- Incorporate the views of Affected Communities into operational and project decision-making;
- Implement grievance mechanisms for affected communities, including mechanisms to preserve cultural heritage;
- Report to affected communities and other stakeholders.

**Figure 4.6:** Galp's Consultation Strategy (source: [8])

### 4.2.3 Shell PLC

Shell PLC considers sustainable development since 1997 [9]. The company has defined its strategic issues and its sustainability commitment within its business activities, projects and PPPs [9].

Shell's approach to sustainability is stated in a number of performance indicators enumerated in their Sustainability Report [9]. The main critical decision factors considered by Shell to assess the decision-making, planning and development processes of future projects or PPPs are: climate change; economic stability; environmental protection; waste/plastics reduction; water and air quality; diversity and inclusion; human rights and social challenges [9]. These criteria has been used to plan the construction of the oil and gas pipelines in the area of the Sakhalin Islands [70]. How? Mainly by defining the several hypothesis for the infrastructures location. Unfortunately, because of lack of collaboration between stakeholders (internal and external) and competing entities (i.e., Shell and Exxon), these companies run their pipes in conflicting arrangements: north-south direction trespassing all rivers that run in the east-west direction; through the surrounding terrains, in the east-west direction across the islands, respectively [70]. This is proof of deficient utilization of the strategic approaches to SEA (such as the ST4S methodology), by both leading to unnecessary financial, environmental and social costs, from the mistake of not planning projects in a collaborative way [70].

The UN Sustainable Development Goals (SDGs) addressed by Shell that play a key role in the projects and PPPs developed, planned and monitored by the company are in the Figure 4.7.

Powering Progress goal	Achieving net-zero emissions	Powering lives	Respecting nature	Core values
UN SDG	7, 9, 13	5, 7, 8, 10	6, 12, 14, 15	3, 16, 17

**Figure 4.7:** SDGs explicitly addressed by Shell (source: [9])

Shell is very careful of the partnerships chosen to achieve the proposed objectives (SDG 17 - Partnerships for the goals), using, for example, Dalberg's Advisory strategic teams and Vivid Economics strategic practices, to teach policymakers and organizations on how to plan for the energetic transition and optimize production, distribution and consumption (SDG 12 - Responsible Production and Con-


sumption) [9]. Other partnerships to reduce Shell's environmental and societal impact, to reuse and recycle the long-term quality of land and water resources affected by its activities (SDGs 6, 14 and 15 - Clean water and sanitation, Life below water and Life on land), are developmental organizations such as the International Union for Conservation of Nature (IUCN), The Nature Conservancy, Mercy Corps and RESOLVE [9]. According to Agenda 2030, Shell advocates to mitigate absolute emissions from Scope 1 and 2 operations (50% by 2030), leveraging stakeholder's values, dynamic portfolio and capital allocation (SDG 13 - Climate action) [10].

The key decision problems that were/should have been adequately object of assessment in the Sakhalin Islands project were defined based on the following governance framework of Shell's Strategic Business Units: Board of Royal Dutch Shell PLC, four Board Committees, the Executive Committee, the teams and individuals managing operations [9]. The impact assessment is assisted by the Health, Safety, Security, Environment and Social Performance (HSSE&SP) teams [10]. They identify strengths, weaknesses, opportunities and risks early on the project or PPP [9]. As explicitly mentioned by Shell [9]: "We carry out detailed assessments of the potential environmental, social and health impacts when we plan new projects. These help us to manage and reduce impacts (...) throughout the lifetime of the project, from initial planning through to final decommissioning, (...) look for ways to help local communities benefit from our presence, (...) such as supporting new businesses, improving road safety or access to energy. The results of our impact assessments are made available to the public when we are legally and contractually permitted to do so.". This statement evidences that Shell also applies EIA, beyond other Sustainability Assessment instruments, such as the ST4S strategic road-map.

Shell designed social measures to minimize constraining forces, for example, mental health and physical well-being issues [9]. Ultimately, they try to assess possible burnout signals and recommend employees and other external people to have an open conversation about any feelings that might be daunting their minds (SDGs 3 and 16 - Good health and well-being and Peace, justice and strong institutions) [10].

According to Shell [9], an essential stakeholder to its guidelines for sustainable development is the Safety, Environment and Sustainability Committee (SESCo), a Board Committee member and formerly the Corporate and Social Responsibility Committee. They audit and communicate strategic decisions intra- and inter-departments. This board sets the context to the social and environmental operations that Shell subscribes, choosing the different strategic pathways and methods that lead the company to the commitments with the ISO 14001, TCFD norms and GRI standards pre-defined by its location-specific sensitivities, protocols (for example, business principles, ethics, compliance and lobbying), and external voluntary codes (for example, United Nations' Universal Declaration of Human Rights, International Labour Organization Declaration on Fundamental Principles and Rights at Work and Principles for Countering Bribery) [9].

Shell wants to proactively mitigate the risks caused to the natural landscape (including the use of the resources and consequent discharges in the land and water; SDGs 14 and 15 - Life below water and Life on land) [9]. Then, all should be reported, with the stakeholders approval, in ESG ratings (which are explicitly stated in the Task-force for Nature-related Financial Disclosures (TNFD) Forum and Figure 4.8) [9].

ESG Survey	Score
Sustainalytics ESG Risk Rating	35.1 (September 2021)
MSCI ESG Rating*	AA (September 2021)
ISS ESG Corporate Rating	C+ (October 2020)
FTSE4Good Index Series	Shell has been included in the FTSE4Good Indexes since 2001.
CDP Climate Change	B (December 2021) <a href="#">Download our response to the 2021 CDP Climate Change Information Request (PDF, 2 MB)</a> 
Corporate Human Rights Benchmark	Shell has scored amongst the top 3 companies within the energy industry since 2018, and top quartile within the extractives industry.

**Figure 4.8:** Shell’s ESG Ratings (source: [10])

Transparency is an enabler to innovation and industry advancements and Shell has been voluntarily reporting their environmental and social breakthroughs since the 90s [9]. Their actions towards sustainable development, ESG standards and other frameworks are clear in the 2021 Sustainability Report and the performance data shared by the company (Appendix B, table B.6 and table B.7).

The Report Review Panel ensures complete strategies and suggests improvements to Shell's 2021 Sustainability Report, such as: better contextualization of the data shown; explicit explanations of Shell's plans/projects to obtain its targets; explicit characterization and follow-up of these plans/projects; and lack of connections between different ESG issues [10]. Nevertheless, external consultation of the general public gives proper feedback on how to engage with the society.

Other strategies to comply with the SDGs are: electrical and hydrogen fleets for transportation of goods and better access to reliable energy to on and off-grid customers (SDG 7 - Affordable and clean energy); employment, entrepreneurship programs and training (SDG 8 - Decent work and economic growth); contract suppliers that work under responsible economical, environmental and social best practices (SDG 9 - Industry, innovation and infrastructure) [10].

#### 4.2.4 Hydro-Québec

The 2021 annual and sustainability reports, the 2022-2026 strategic plan and the 2020-2024 sustainable development plan describe the key decision problems used for the Hydro-Québec’s case-study [71]. The company’s vision states that to build a responsible future for energy consumption of local communities

and organizations, driving forces of unity and cost-effective innovations are fundamental [71]. The SEA application, that can be easily tracked with the ST4S approach, is the construction of the hydroelectric dam project in North West Québec, built initially in the seventies [72]. The reasons to apply this instrument comes from the fact that this endeavour involves long-term environmental and social effects for the natural systems and surrounding indigenous communities (i.e., the Cree and Inuit populations), being the biggest power generating site of North America [72].

Hydro-Québec's ambition is to align its projects and PPPs with Québec's Government Sustainable Development Strategy (GSDS) and Agenda 21 for culture [11]. Nevertheless, also addressing The United Nations Development Program and its 17 Sustainable Development Goals (SDGs) [11].

According to Hydro-Québec [7], in 2021, a pandemic year with volatile perspectives and very unstable economies, this Canadian company reported an annual net income of \$3,564 million. Despite this backdrops, it was the best financial yearly performance in the company's history, recording an enthusiastic 97% public satisfaction index (SDG 8 - Decent work and economic growth) [7].

For the SDGs concern, Hydro-Québec invested \$4,9 billion in new infrastructures in the province and in the Innovative Projects Program, that inspires civil engineers, real estate developers and contractors to install district energy systems (SDG 9 - Industry, innovation and infrastructure) [11]. Alongside the digitization of the business and the investment in innovative initiatives that respond to larger infrastructural costs and real-time customer needs, the company takes advantage of its expertise on IT and sustainability to develop AI solutions, cybersecurity programmes and electrical fleets [14]; [71]; [12].

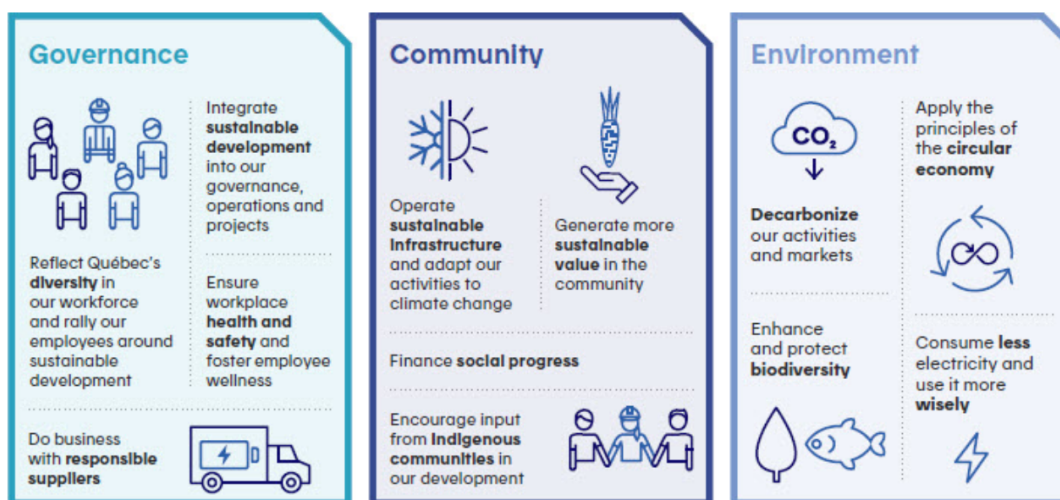
With broad consultation of the internal and external stakeholders early in the process, the Strategic Plan 2022–2026 was aligned under uncertain paradigm shifts [14]. It outlines the major restraining forces that are expected in the long-term plan to transform non-efficient and non-competitive distribution of high-quality energy into a reliable and smart production schedule that integrates renewable energy sources which will respond to the increased demand and unbalanced grid design (SDG 12 - Responsible consumption and production) [14]; [71] [14].

From the 2021 Annual Report, the insights that sustain the use of strategic approaches to the SEA process in order to attain to the Sustainable Development Goals within the company's projects are: public participation in the early stages of any project (ideas and aspirations shared through thousands of surveys to employees and regular citizens); selection, monitoring and evaluation of the relevant inputs coming from the diverse employees; and unite efforts with clients to facilitate the efficient energy conservation targets proposed by the government and international associations [3]; [14]. It is fundamental to mention that the ST4S approach to SEA uses public participation and it contributes to the SDGs, but, not all public participation activities that contribute to the SDGs are used under SEA processes.

The chairwoman, Jacynthe Côté, approved in the new strategic plan the following strategic decisions: build 1,250-MW lines in New York (alongside Transmission Developers) to provide clean and quality

energy that should supply approximately 20% of New York City's electricity needs (SDG 11 - Sustainable cities and communities); regulate OHS management risks to the employees, in order to avoid injuries or fatalities on the job site and help fight COVID-19 by serving as a vaccination clinic close to the community (SDG 3 and 10 - Good health and well-being and Reduced inequalities); hire and buy resources from indigenous people that coexist in the same territory of the projects (Declaration of Commitment to the First Nations and the Inuit Nation) [14].

The Sustainable Development Plan 2020-2024, is based on the GRI standards [14]. It considers the stakeholders expectations and the respective change agents influence to assess the discrepancies between best managerial practices in the area of CSR and those found in ISO 26000 [14]. The collective prosperity goal to transition to a carbon neutral economy by 2030 is in the core of the main sustainability issues faced by Hydro-Québec [14]. This Plan presents 12 strategies (Figure 4.9), each of them associated to, at least, a specific driver and one performance indicator, around the topic of strategic ST4S methodology: governance (based on the common good with an organizational structure that ensures a fair, inclusive and safe workplace typical of a government owned company); community (new project's social acceptance/wealth and reliable, accessible and affordable electricity supply from cleaner energy sources); environment (climate change and the loss of biodiversity); and territorial planning (based on the location of the building projects and its impacts in the communities affected) (SDGs 7, 13, 14 and 15 - Affordable and clean energy, Climate action, Life below water and Life on land). The UN Sustainable Development Goals are presented in the Appendix B, tables B.8 and B.9:



**Figure 4.9:** The three pillars of Governance, Community and Environment (source: [11])

Returning to the James Bay situation, the factors stated previously were the main criteria to assess the strategic options for this mega-infrastructure location and development project. It helped to choose from different pathways that would minimize the impacts of the diversion of water flows into certain areas

(comprised of villages that could be totally or partially submersed), the destruction of natural landscape, the displacement and unforeseen effect from this type of mega-projects, for example, pollution of water beds through mercury produced by rotting vegetation within the reservoir area [72]. Along the time, there as been some social resistance to the full accomplishment of this project, which means, these CDFs need to be reevaluated to select the alternative (i.e., strategic option) that better answers to the societal needs [72].

A method to be pointed out in this company to be transparent and avoid corruption is ISO 37001:2016 [14]. Other practices that enhance responsible procurement and the fight against poverty, social inclusion, academic completion, gender equality and the integration of immigrants (SDGs 1, 4 and 5 - No poverty, Quality education and Gender equality) are subscribed in signed documents which direct the guidelines of Hydro-Québec, such as, the Supplier Code of Conduct [71].

There are clear alternatives that Hydro-Québec can pursue in favor of achieving it's low-carbon energy transition goal [14]; [71]. As stated in the first and second chapters, they require changes in mentalities, attitudes and behaviours, alongside with the technological advances contributing to decarbonization, resilient clean-tech innovations, decentralization of the services' supply to indigenous communities and biodiversity protection [71]; [12].

From Figure 4.10 it is clear that Hydro-Québec is benefiting from a strategic approach to achieve the Sustainable Development Goals, by setting actionable tasks to complete long-term and complex objectives by 2030. This figure summarize the seven SDGs and 11 targets that Hydro-Québec focuses mainly [71].

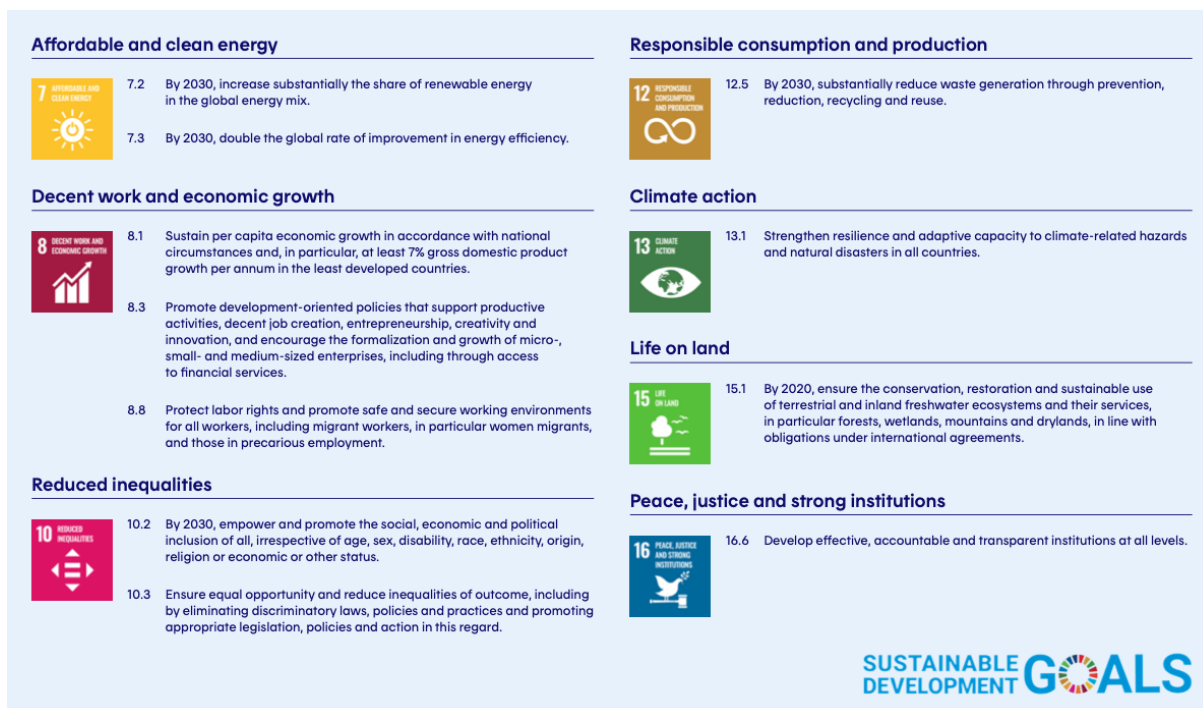
Finally, Hydro-Québec also delineated ESG criteria in the decision-making, planning and development processes of its projects and PPPs [71]. In hydro-power projects, such as the James Bay dam, the company identified the following main critical decision factors: early stage assessment of options of alternative energy sources and water needs; and project locations within the river basin/region [7].

### **4.3 Discussion**

In this section, the results demonstrated previously are discussed.

In the questionnaire, it was found that overall SEA application is still confined to specific geographies, economic activity sectors and research/academic fields. In the particular case of Portugal, the main nationality from the sampled respondents, it was acknowledged some lack of recognition of this instrument within private initiatives' sustainability consultants, experts and managers (a third is not familiar with it at all and only one other third has used it already). But, it is not confined to SEA, also EU Sustainable Taxonomy is not a widely known concept. In the bright side, ESG Ratings and Criteria, jointly with the SDGs, are being more and more included in board meetings and business plans, following international





**Figure 4.10:** SDGs and Agenda 2030 reportedly addressed by Hydro-Québec (source: [12])

trends from competitors and other industries.

It was interesting to note that, when asked about the role of these strategic or traditional instruments in the attainment of the SDGs, respondents supported the Hypothesis 2 and 3, but contradicted Hypothesis 1 at some extent, by stating that strategic SEA, EIA-project, ESG and EU Sustainable Taxonomy approaches contribute to achieve targets from the Sustainable Development Goals. Also, it was found that uniform and proper regulation will be key to calibrate all initiatives into a common objective. The case-studies and the questionnaire sustain clearly how companies are setting rules and policies with the help of SEA, EIA, ESG, LCA, EU Sustainable Taxonomy and other standards to effectively attain the Sustainable Development Goals (donations to under developed, poor and displaced communities (money, food, clothes, hygiene, sanitation and health systems); through owned NGOs or direct funding for established organizations; settlement of committees and other governance bodies to address sustainability issues and establish mechanisms for reduced gender and minorities inequalities; collaboration with universities and other academic institutions to promote education access to the society; provision of energetic sources at competitive prices and obtained through renewable generation, which stimulates innovation, economic growth and sustainable cities/communities; promotion of responsible consumption patterns to the customers, to manage climate change, land-use, water management, peaceful interactions between entities and communities).

Answering to the first sub-question, a portion of respondents denoted that these instruments have

a bigger impact on helping align stakeholders' social constructs and interests, more than contributing to sustainable development. Also, they produce information that is used by planners in the review and changes to the development processes of projects and PPPs, allowing to shape decision-makers strategies in relation to future developments. But, there is more evidence of the role of internal stakeholders than external ones, in the engagement activities with companies' projects or PPPs.

For the last sub-question, questionnaire respondents and company reports show that the ST4S approach to SEA, the SDGs, the ESG Criteria and the EU Sustainable Taxonomy instruments are recognized as relevant and positively contribute to provide clear mechanisms, guidelines and recommendations to: help engage working and executive level employees; hold the mirror up on the internal stakeholders' performance; and help with the comparability to initiatives successful in the attainment of sustainable targets and indicators. Still, there is always room for improvement, mostly about the lack of standardization of the use and measurement associated to these tools at different levels (temporal, geographical, sectorial and institutional).

To confirm Hypothesis 3, EU Sustainable Taxonomy was found to have a reduced to moderate role in addressing SDGs, only allowing to understand what activities can be considered sustainable. Sustainability practitioners also stated the need to have public and aggregated dashboards to monitor the evolution of the achievement of the SDGs at the country, regional, local and sectorial level. It is very expensive to report on this topic for an individual company, so integrating it in an universal follow-up tool, would make the implementation of new projects and PPPs easier.

From the questionnaire results, SEA is considered to bring more benefits than costs to projects or PPPs decision-making, planning and development processes. The most relevant criteria that a Strategic Environmental Assessment must follow is: early stage definition, assessment and discussion of strategic options and alternatives (multiple energy sources, water needs, project locations, etc.); environmental and social information integration to the implementation process; continuous iteration of the vision and global involvement of the planning and project management teams in the learning and innovation activities; administrative sponsorship on transforming and teaching employees and surrounding communities with attitudes that would benefit strategic SEA implementations.

Sustainable Development Goals should be integrated and evaluated as a whole. Big companies are aware of it and try to accommodate the largest number of targets and indicators as possible. But for start-ups, very small in size and effects produced, they only look to prioritize a sub-set of these goals to address at a time. This sustains the insight that the attainment of the SDGs implies having a relevant budget to invest in sustainable projects or PPPs. Bear in mind that it is difficult to manage these goals in very large companies, with fragmented and dispersed responsibilities, because it needs to guarantee vision and mission convergence between management and low-level collaborators.

To answer the third sub-question, another possibility, not totally consensual, to prioritize sustainable



factors in the organizational action plans, would be to promote a sustainable development mindset for start-ups when envisioning their Business Model Canvas and Plan as soon as possible. This would help to conceptualize needs for funding, strategic partnerships and the choice of investors (VCs, Friends, Family and Fools, etc.), based on the shared value proposition and responsibility to environmental and social issues.

Finally, when asking (co-)founders and employees about the role of strategic SEA and EU Sustainable Taxonomy to achieve the SDGs, it was found that the taxonomy is used as a core go-to-market strategy for start-ups in the entrepreneurial European landscape. Since bringing sustainability concerns into business is already difficult enough, these initiatives ask for reconciliation in the use of these instruments, tying social and environmental issues within a single tool (for example, Business Model Canvas 2.0 - Sustainability Building Block).

There is a mention of the use of LCA to have external agents monitoring the contribution of entrepreneurial activities in the SDGs. The requirements of the taxonomy and other scientific assessments as LCA have helped to understand strengths and weaknesses of projects and PPPs.

In the case-studies analysis, the explicit evidence of the strategic ST4S approach to SEA application is scarce (except for REN and Shell PLC). But, implicitly, they can be recognized in the reported practices of the managers, planners and project leads to define their decisions, routes of development and activities to be monitored after implementation. This is a clear support to the Hypothesis 2. So, it was found that these approaches have an active role in the achievement of long-term and complex objectives, to reach sustainable development within business strategies.

Moreover, it was found explicit and implicit uses of the conventional SEA process or the EIA effects-based instrument. This is a partial contradiction to Hypothesis 1 due to the fact that these approaches are mentioned in private organizations strategic reports and decision-making processes, but not with the final objective of helping and having an active role in solving uncertain environmental, social and economical organizational issues. Instead, they only ensure that the impacts of current projects are not endangering future generations and ecosystems.

Whereas, ESG Criteria and Ratings, GRI Standards and EU Sustainable Taxonomy are explicitly mentioned in the documents and sources reviewed. These policies are being pushed by international regulations, hence the companies and start-ups are obliged to express their commitment to these rules believed to guide business strategies and intra-/entrepreneurial initiatives towards sustainable development. They also serve as basis to responsible investments done by companies and to bring more value into their product, brand, shareholders and customers.

When reviewing companies' business strategies, it was found that there are Critical Decision Factors more frequent than others. Once again, these are elements that set the stage for the evaluation of the several strategic options for the different strategic pathways of each case-study (for instance, the geo-

graphical distribution of REN's electricity and natural gas networks; adequate location and execution of Galp's refinery in Sines; construction of oil and gas pipelines in Sakhalin Islands by Shell; and establishment of mega-dam projects in Québec's area). Answering the second sub-question posted in the chapter 1:

Starting with Hydro-Québec, leadership and governance are critical decision factors to enhance employees autonomy and willingness to innovate within projects. Appropriate boards and committees, that manage expectations from the workforce and the needs of the potential environmental/social projects, will help to distress subordinates about issues that should be tackled by top management first. Moreover, the company must ensure that society is on board with the projects assumptions, so social experience related to the quality of the service/product provided is another critical decision factor that should be assessed using social proof (interviews and surveys with surrounding people), extension of contracts with the provider, returning customers (conversion and churn rates towards the project's delivery), support data (complaints), etc. These are combined with inner considerations on the topic of climate responsibility and mitigation (for example, the use of renewable energy sources). These factors complement the three pillars that support Hydro-Québec's values: Governance, Community and Environment.

Concerning Hydro-Québec, the two Portuguese organizations analyzed, i.e., REN and Galp Energia, and Shell PLC, there are critical decision factors that are more commonly referred: territorial planning and climate change management (including, referrals to the investment in the natural and cultural capital of cities, villages and any other natural landscapes).

Territorial planning (environmentally and socially speaking) was clearly stated in these companies' needs to incorporate local communities insights into the planning and development processes of the different projects. REN builds stations and spreads transmission lines around houses and people's terrains, so they must ensure that it is safely built and maintained. The benefits that these electrical and natural gas networks bring to rural locations are undeniable, mostly relating to improved social conditions (television, internet, energy consumption, etc.). Galp, in the other hand, also focuses on having gas stations close to all communities in order to provide equal mobility opportunities to all citizens. Hydro-Québec has the same worries when evaluating a new dam infrastructure (due to possible flooding of small communities). Shell PLC has this in mind to define the appropriate location of new distribution networks for oil and gas (based in natural protections and societal feedback).

About climate change management, it is shown the purpose of these companies to avoid damaging environmental ecosystems. In addition, the government and international organizations push these companies to achieve certain targets (Agenda 2030 and the Sustainable Development Goals), as was mentioned before. It is explicit that Hydro, Shell, REN and Galp are proactively performing activities, not only to mitigate climate action, but also to prevent it. Through investments, classified as sustainable by the EU Sustainable Taxonomy, in scientific research, NGOs and other projects, these companies protect

areas from deforestation, species extinction and unsustainable internal operations (linkage between the sustainability assessment tools and the EU Sustainable Taxonomy/ESG Criteria best practices).

The investment in natural and cultural capital demonstrates how these companies preserve heritage and natural resources from degrading and disappearing before being enjoyed by future generations. Alongside municipalities and local associations, the companies are allocating capabilities and creating jobs for projects with the aim of renovating small isolated villages, natural parks and displaced people.

More specifically, REN infers another CDF: internal well-being, safety, stability and workforce motivation. A lot of different measures were taken to make the workplace a balanced and harmonized environment between employees and managers. Empowerment, diversity, inclusion and equality are core elements defended by the company to motivate employees to be ambitious and search for new ideas that can make the company more efficient, profitable and sustainable.

Galp Energia also mentions the following critical decision factor to the decision-making processes of the company: social emergencies. Using its non-for-profit association, Fundação Galp, the company monitors and predicts emergency situations to help people in care, remote communities, children with low quality of life, etc.

To sum up, Shell PLC considers the combination of environmental protection and economic prosperity towards a sustainable growth, the efficacy of appropriate governance to sustainability and equal opportunities as the three critical decision factors that rule the company's strategic vision to achieve sustainable development (targeting to specific SDGs). To satisfy the environmental protection component, Shell established plastic and waste management policies, which force the company's practices to be circular and not exploiting natural resources irresponsibly. With adequate attention of the residuals produced, this company fights for good water and air quality. Then, combining it with economic prosperity and efficient governance bodies, Shell is well structured to decide, choose, plan and develop projects or PPPs that benefit the environment and the society, and to enforce legal and ethical codes that are shared within the employees (diversity and inclusion are tools to enhance the teams' performance and innovative capabilities, respecting differences in age, race, religion, etc). Finally, the equality factor is defined under Shell's mission to embrace CSR in terms of poor communities in degrading life conditions, but also, local villages or towns that might be affected by the company's extractive operations.

These factors should be discussed between all these entities, as the practices from one company can be advantageous to the other. Different approaches to sustainability do not need to be substitutes, they can complement strategic pathways from other companies or start-ups. Therefore, it is not enough to comply only to the legal frameworks supported by international laws. Private organizations proactivity to use instruments as ST4S is fundamental to change plans' designs, present innovative solutions, choose the appropriate alternative and monitor strategic implementations already on-going. Also, industry/-sector events can promote synergies between competitors and players that strive for better managerial

decisions to safeguard responsible operations. Sustainability must go beyond environmental and climate change concerns. All the strategic values, vision and mission of each company, its governance structure and social interventions must be confronted to the potential impact it has on the Earth's systems and Human activities.

# 5

## Conclusions, Limitations & Future Work

### Contents

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5.1	Conclusions . . . . .	71
5.2	Limitations and Future Work . . . . .	72

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This chapter presents and summarizes the final conclusions, recommendations and limitations of the research done in this dissertation. Furthermore, it is proposed future directions that can complement the ideas and results gathered in this document.

In this section, the insights discussed in the previous chapter are fine-tuned, to allow for a brief reflection on the main findings from this dissertation objective: strategic SEA approach - ST4S - role in the attainment of Sustainable Development Goals within business strategies and entrepreneurial initiatives.

## 5.1 Conclusions

Concerning the main research problem presented in chapter 1 and according to the case studies and questionnaire results, it is believed that the ST4S approach to SEA can be used by private initiatives to attain Sustainable Development Goals, if used under the frameworks and road-maps designed by Partidário (Figures 2.3, 2.4 and 2.5).

As characterized in Figure 2.2, this approach differs from the older ones (project-EIA and traditional effects-based SEA), by designing the decision-making, planning and development processes from the get-go of a project or PPP with environmental, social and economical concerns. Basically, it goes deeper in the sole implementation of an impact assessment method, that focuses mainly on scoping, mitigation and monitoring outcomes. From the survey and the case-studies analysis, one relevant problem is that the same practitioners who carry out project-EIA, typically carry out SEA processes and, as a result, SEA applications tend to adopt the traditional effects-based approach. Yet, having a strategic approach to company's projects and everyday tasks is a key behaviour to advocate sustainable development, as shown in the questionnaire results.

About EU Sustainable Taxonomy and ESG scores, it can be argued that industry standards, such as ISO and PAS 2080 for infrastructure projects, are, at the moment, significantly more impactful than these pure classification tools in the use of the ST4S approach to SEA. Feedback and conversations with respondents of the survey brought to attention the real importance of those industry standards (which are highly debated and agreed in international communities). In general, it was discussed that all these instruments should be linked to assist in decision-making. Moreover, respondents expressed that SEA, jointly with EU Sustainable Taxonomy applications, put more pressure in the companies to attain the Sustainable Development Goals.

It is a no-brainer that the key challenge for a start-up must be the definition of a user-centered value proposition that solves real problems of the market. Although, to move forward with overall sustainable development in the economy, early stage start-ups must put aside some time to theoretically and practically consider the impacts of their ideas in sustainability. Entrepreneurs must have sustainable development in mind when integrating strategic thinking to build new businesses and ventures. This al-

ready happens in start-ups with value propositions that target sustainability. To amplify this conclusion, the integration of entrepreneurial concerns in the Sustainability Assessment field of study is known to be the "elephant in the room" and there is an urgent focus to frame its conceptualization when applying strategic SEA processes to start-ups.

The most mentioned SDGs addressed in the private sector are presented in the results section. However, it is acceptable that they relate to the economic sector of activity from the case-studies and questionnaire's respondents. More, as supported by literature [54], in the private sector, the SDGs that are more business-related (SDGs 8, 12 and 17, for example) show an increased presence in the sustainability and strategic reports from companies, than the ones that concern social and environmental issues. It is clear from literature, questionnaire and case-studies that private initiatives are integrating the SDGs in their statements, jointly with specified policies and practices to address them (for instance, the more common human-rights action plans put in practice in companies to embrace gender, age, etc., equality) [54].

Real examples of the implications, derived from the environmental and social programmes done with consultation of the general public to teach on the field and through new digital ways how to balance resources and minimize material waste, are being increasingly common. These studies highlight the synergies between policies, plans, programmes and projects in the interlinked ecological, economical and social problems inherent to strategic planning. A proposed methodology for data-driven validation of the interconnectedness of the SDGs, EU Sustainable Taxonomy and other finance tools must be developed. It must serve to aid decision-making in the preparation and monitoring of long-term policies. More, it facilitates multi-level assessment of sustainability, making it possible to strategize on complex environmental, social and economical projects and PPPs.

It is crucial to innovate solutions that mitigate environmental and social effects from projects and PPPs, and assist in the compliance of regulations applied to private initiatives [22]. Basically, ST4S approach to SEA shown, explicit and implicitly, to be particularly instrumental to manage territorial planning and ease policy coherence across industries and decision-making levels within energetic decarbonization processes, sustainable food, land, water, cities and communities [5]; [3].

## 5.2 Limitations and Future Work

The biggest challenge to the core topics of this dissertation seems to be the integration of a long-term decision-making, planning and development vision, with a short-term political mandate to achieve the SDGs. That is why it was found that integrating SEA into policy decisions in many countries can be difficult. To help on this, future research with companies from diversified sectors and that are developing SEA processes, simultaneously with the investigation, should be done as well. The search for



geographical commonalities is an interesting direction to find relevancy of this topic in scientific terms.

Private initiatives have a significant importance in promoting sustainability (environmental, social and economical), mitigating damaging activities and guiding best practices to decision-making, planning and development processes of projects and PPPs [1]; [3]. So, finding ways to assess their accurate role in these activities must be extensively researched.

It was gathered some minor results stating that the strategic SEA approach - ST4S - has a limited role to address Sustainable Development Goals. This should be taken in consideration to be cautious in the assessment of different strategic options. Now is the moment to assess the connection of SEA to the Sustainable Development Goals, which were only defined since 2015, but must be reached by 2030. Other tools, as the EU Sustainable Taxonomy and ESG policies, have only been implemented recently and for certain sectors of economic activities. Therefore, it is still a bit too soon to properly evaluate links between all these instruments.

Furthermore, classification, of the EU Sustainable Taxonomy, and ratings, from the ESG criteria, are scored and supported by investors and international associations that are directly involved with the same companies and start-ups under evaluation. In this sense, they use the classification sponsored by their funds to justify large "responsible" investments in private initiatives. Previous literature says that the lack of SEA effectiveness derives from its implementation as a stand-alone process, but the validation of the integration with, or linkages to, other forms of assessment and decision-making (EU Sustainable Taxonomy, ESG Criteria and industry standards), must be researched further [22]. EU Sustainable Taxonomy is built to classify change and, therefore, has reduced to moderate impact on a constrained selection of the SDGs. Additionally, SDGs construction was based and adopted without reference to any other framework, which hinders the integrated sustainability reporting that is pursued with the combinations of these instruments towards sustainability. But, the importance of these instruments (EU Sustainable Taxonomy and ESG Criteria) to compare financial options and portfolios is unquestionable, allowing to infer what are high and low-ranked companies in sustainability. Nevertheless, not all SDGs are reflected in the current environmental taxonomy. In the future, taxonomy regulation will provide tools to measure the percentage of green activities financed by the bank - an instrumental KPI to measure strategic targets and volume of sustainable business within the company's pipeline.

The reason why there are Sustainable Development Goals more addressed than others is not possible to extract from this study. If it is related to ease of attainment, government pressures, existent methods, etc., is a topic of interest to pursue and test more efficiently. This research was mainly looking to see if the instruments described across this dissertation allow to attain these goals, not why they support the attainment of some regarding to others. Recent literature and its review revealed that pure impact assessment instruments (for example, EIA) directly induce sustainable development [5]. Nonetheless, there is a lack of evidence to the links of these instruments to Sustainable Development

Goals (limited literature and case-studies reports that reflect EIA applications to attain SDGs) [5].

The limitations recognized to this research are: small sample of companies, start-ups and employees that can bias the research towards an idea shared by an industry or organizational team; trying to find impartial observers of the application of these instruments, instead of practitioners that will for sure advocate for their work; existence of clear and practical legislation to put these instruments into practice with desired sustainable development outcomes (which hampers strategic thinking); usefulness of the external stakeholders feedback to contribute to strategic SEA processes; real analysis of the measures implemented, avoiding green-washing, politically correct speeches and reports; and the lack of importance given to consulting internal and external stakeholders about ESG scores from their private initiatives [58].

Other options of future work is the search for more strategic and creative SEA processes, that promote policy-based approaches and support good governance to overcome periods of economical, social and/or environmental recession [18]. From the results and recent literature, SEA needs to be subject to more proactive implementations from governments and any private initiatives, in order to develop innovative solutions and multi-faceted concepts to address sustainability [1]. There is the need to find deeper answers to the following research questions: Should the strategic SEA approaches integrate the decision-making and planning processes within the context in which SEA is undertaken by the same practitioners as those that implement the traditional SEA projects and PPPs? Should SEA remain separate from the combination and linkage to other instruments (as the ones discussed in this dissertation) to guarantee transparency and accountability of sustainability reports?

Concluding, private initiatives should reflect better on their own projects' and PPPs' environmental and social impacts, how they can reduce those impacts, and what should be the effort of higher consistency in the measurement and analysis of environmental and social-related data. They must match the SEA application expected results (economical, environmental and societal prosperity from the beginning of a project or PPP, which can be adapted across specific decision windows during its life-cycle) to the delivery of sustainable projects and PPPs that clearly demonstrate how the strategic SEA - ST4S - process led to the achievement of the SDGs [18].

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# Questionnaire

## **A.1 Instituto Superior Técnico Master's Dissertation - Strategic Environmental Assessment (SEA) for Entrepreneurial/Private Initiatives**

My name is Afonso Maria Rodrigues Bustorff Silva, 23 years old, and I'm writing a dissertation for the Master's degree in Management of Innovation & Entrepreneurship at Instituto Superior Técnico (IST) with professor Maria Rosário Partidário. With the objective to study the application of Strategic Environmental Assessment (SEA) methodology on investment/business plans with a strategic and sustainable scope, this questionnaire intends to collect information among private and entrepreneurial stakeholders that aim to build a strategic pathway along their projects with the end-result of contributing to the SDGs (Sustainable Development Goals) and Agenda 2030. We believe that Strategic Environmental Assessment, ESG Criteria and EU Sustainable Taxonomy benefit decision-making teams and consultants that, directly and indirectly, approach these strategic and sustainable challenges within private companies/start-ups. This questionnaire allows you to possibly envision future action plans and build-

ing communication bridges between stakeholders. This questionnaire is anonymous and it will take a maximum of 20 min. The results will be analysed in an integrated way, ensuring confidentiality of the answers, i.e., with no indication of the organisation(s) or the stakeholder(s) involved. There are no right or wrong answers, so we ask you to answer in a spontaneous way to the questions, based on your practical experience. For any clarification, you may contact me in [afonso.bustorff.silva@tecnico.ulisboa.pt](mailto:afonso.bustorff.silva@tecnico.ulisboa.pt). Your participation is very important to us!

Best regards,

Afonso Bustorff Silva

### **A.1.1 Participation Disclaimer**

In the following question, it is mandatory to answer if you accept or not to share your insights with the purpose of gathering information to the results and discussion of this dissertation.

My participation in this questionnaire confirms that: I read and understood the purpose of the questionnaire (academic research on the topics mentioned above); It has given me the opportunity and means to raise questions about the investigation in which this questionnaire applies to; I agree to voluntarily participate in this investigation (multiple choice): **Yes/No**.

Thank you in advance for your participation! If you are interested to discuss this topic further or share any case study applied by your organisation/other source, please leave your email!

### **A.1.2 Sample Characterisation**

In this first section, the purpose is to divide the sample in some spheres of study to prove hypothesis in appropriate contexts.

Scope of Application (multiple choice):

- Private Company - **Go to sub-section (Companies)**;
- Start-up or Entrepreneurial Initiative - **Go to sub-section (Start-ups)**;
- Other - **Go to sub-section (Out of Sample)**.

### **A.1.3 Companies**

If you entered this section, it means you are/were employed in a private, mid to large-sized or multinational, company. It starts with general questions regarding the relevant topics for discussion converging to more specific subjects of matter.

Professional Activity (multiple choice): **Administration/Manager/Internal consultant/External consultant/Expert/Advisor/Other....**

Field of Expertise (check-boxes): **Planning and/or Process Design/Economics and/or Management/Procurement and/or Project Management/Engineering/Sustainability/Human Resources Management/Other....**

How familiar are you and your company with the Strategic Environmental Assessment (SEA) instrument (multiple choice)?

- Only with the SEA objective;
- Only with the SEA process;
- There has been involvement in SEA;
- Not familiar at all.

Who is responsible for applying Strategic Environmental Assessment (SEA) in your company (check-boxes)? **Environmental authorities/Project and Planning Managers/SEA consultants/Project team and advisors/In my knowledge, we do not apply SEA./Other....**

Can you identify a case in your company where Strategic Environmental Assessment (SEA) was applied? (short answer text).

According to the case mentioned above and others developed in your company, please describe the importance of the following potential advantages that SEA bring to your company's strategic approach to sustainability and investment projects? (score from 1 – totally disagree to 5 – totally agree, and 6 - I do not know!):

**SEA allowed the integration of environmental and/or social information to project's development processes.;**

**SEA helped with the establishment of priorities early-on the process.;**

**SEA contributed to alter the vision of the plan mid/long-term.;**

**SEA contributed to the discussion and definition of strategic options of development.;**

**SEA promoted the engagement and the contribution of the public and other sectorial entities.;**

**SEA helped the planning team in learning and innovating processes.;**

**SEA had a fundamental role to the attainment of the SDGs in the company.;**

**SEA had a fundamental role to obtain sustainable investments in the company.;**

**SEA produced information that was used by planners in the review and discussion of changes.;**  
**SEA allowed to alter decision-makers mindsets and vision in relation to future developments.**

From the following, which are the main difficulties for a company to apply a Strategic Environmental Assessment (check-boxes)? **Clarity of the legislation/SEA guidance useful and sufficient/Capacity of the public to contribute to SEA/Collaboration between entities for decision-making/Motivation of entities to enhance SEA/Planning practices to integrate SEA/Other....**

Do you think the benefits from a Strategic Environmental Assessment outweighs its costs (multiple choice)? **Yes/No/Other....**

How familiar are you and your company with Sustainable Finance (multiple choice)?

- Only with the EU Sustainable Taxonomy;
- Only with responsible investments;
- Overall acknowledgement about ESG;
- Not familiar at all.

Do you consider that your company successfully took advantage of Sustainable Finance (multiple choice)? **Yes/No/I am not aware of the use of these tools by my company..**

In your opinion, do you find EU's Sustainable Taxonomy tools (Compass, excel sheets, etc.) difficult to use or that they are not useful to classify private corporate projects as sustainable? Please justify your comment. (long answer text).

How familiar are you and your company with the SDGs (Sustainable Development Goals)? (score from 1 – not familiar at all to 5 – Full acknowledgment).

Which SDGs (one or more) have been/are being addressed by your company? (short answer text).

Which were the instruments used to address those Sustainable Development Goals (SDGs) (check-boxes)? **Strategic Environmental Assessment (SEA)/Environmental Impact Assessment (EIA)/EU Sustainable Taxonomy/ESG Criteria/Our company does not address any SDG./Other....**

According to the instruments used, the company was/is being successful to attain the proposed SDGs (multiple choice)? **Yes/No/Company is not involved with a strategy to comply with the SDGs and**

## **Agenda 2030.**

In your opinion, what is the most common difficulty that may impede a company to be successful in the attainment of the Sustainable Development Goals? (long answer text).

Please evaluate how much do your company consider the following aspects within its strategy/instruments used in the attainment of the Sustainable Development Goals? (score from 1 – not considered at all to 5 – fundamental to the company, and 6 - I do not know!):

**Administration/Management support to any of these tools.;**

**Stakeholder involvement to project's development processes.;**

**Early-on analysis of environmental and social impacts from the proposed plan/project.;**

**Late consideration of environmental and social impacts on the proposed plan/project.;**

**Proactive and efficient communication between all internal and external stakeholders/employees.;**

**Motivation to innovate and search for sustainable solutions within the company and its entrepreneurial initiatives.;**

**Strategic approach to the company projects and everyday tasks.;**

**Importance of the public consultation and participation to obtain feedback.;**

**Vision and mission convergence between employees and managers.;**

**SEA's practice and mentality.;**

**EU Sustainable Taxonomy Compliance.:**

**ESG Criteria.**

Do you have any comments/suggestions about how strategic thinking instruments, such as, SEA and EU Sustainable Taxonomy, had a role on the attainment of specific Sustainable Development Goals (SDGs) monitored by your company? (long answer text).

### **A.1.4 Start-ups**

If you entered this section, it means you are/were employed in a start-up or entrepreneurial activity. It starts with general questions regarding the relevant topics for discussion converging to more specific subjects of matter.

Role (check-boxes): **(Co-)Founder/Investor/Advisor/Expert/Employee/Consultant/Other....**

In the Business Model construction of your start-up was considered any sustainable aspect? Please

answer Yes/No and justify how it affected the business plan and investments done by the start-up to consider it. (long answer text).

In your opinion, should the Business Model Canvas integrate a new block for sustainable considerations? Please answer Yes/No and justify. (long answer text).

In the possibility of a tool, already proved in the public sector to comply with the Sustainable Development Goals (SDGs), would you consider using it for your start-up (multiple choice)? **Yes/No/Other...**

If so, when (check-boxes)? **Early-on in the Business Model construction/Mid-term when developing Business Plan/After first investment/When escalating the business internationally/Other....**

How familiar are you and your team with the Strategic Environmental Assessment (SEA) instrument (multiple choice)?

- Only with the SEA objective;
- Only with the SEA process;
- There has been involvement in SEA;
- Not familiar at all.

Who is responsible for applying Strategic Environmental Assessment (SEA) in your start-up? (please specify the role inside the company). (short answer text).

Can you identify a case in your start-up where Strategic Environmental Assessment (SEA) was applied? (short answer text).

According to the case mentioned above and others developed in your start-up, please describe the importance of the following potential advantages that Strategic Environmental Assessment (can) bring to your start-ups' strategic approach to sustainability and investment projects? (score from 1 – totally disagree to 5 – totally agree, and 6 - I do not know!):

**SEA allowed the integration of environmental and/or social information to project's development processes.;**

**SEA helped with the establishment of priorities early-on the process.;**

**SEA contributed to alter the vision of the plan mid/long-term.;**

**SEA contributed to the discussion and definition of strategic options of development.;**

**SEA promoted the engagement and the contribution of the public and other sectorial entities.;**

**SEA helped the planning team in learning and innovating processes.;**

**SEA had a fundamental role to the attainment of the Sustainable Development Goals in the company.;**

**SEA had a fundamental role to obtain sustainable investments in the company.;**

**SEA produced information that was used by planners in the review and discussion of changes.;**

**SEA allowed to alter decision-makers mindsets and vision in relation to future developments.**

How familiar are you and your team with Sustainable Finance/Investment (multiple choice)?

- Only with the EU Sustainable Taxonomy;
- Only with responsible investments;
- Overall acknowledgement about ESG;
- Not familiar at all.

What is your experience with EU Sustainable Taxonomy Compass and excel tools? (score from 1 – none to 5 – Very Experienced!).

In your opinion, do you find EU's Sustainable Taxonomy tools (Compass, excel sheets, etc.) appropriate to use and successful to plan sustainable projects and entrepreneurial initiatives? Please justify your comment. (long answer text).

Are you aware of the possibilities to apply these instruments (multiple choice)? **Yes/No/Other....**

How familiar are you and your team with the SDGs (Sustainable Development Goals)? (score from 1 – not familiar at all to 5 – Full acknowledgment).

Which SDGs (one or more) have been/are being addressed by your start-up or entrepreneurial initiative? (short answer text).

Which were the instruments used to address those Sustainable Development Goals (SDGs) (checkboxes)? **Strategic Environmental Assessment (SEA)/Environmental Impact Assessment (EIA)/EU Sustainable Taxonomy/ESG Criteria/Our start-up does not address any SDG./Other....**

According to the instruments used, the start-up was/is being successful to attain the proposed SDGs (multiple choice)? **Yes/No/Start-up is not involved with a strategy to comply with the SDGs and Agenda 2030.**

In your opinion, what is the most common difficulty that may impede a start-up to be successful in the attainment of the Sustainable Development Goals? (long answer text).

Do you have any comments/suggestions about how strategic thinking instruments, such as, Strategic Environmental Assessment and EU Sustainable Taxonomy, had a role on the attainment of specific SDGs monitored by your start-up? (long answer text).

### **A.1.5 Out of Sample**

If you chose other than private company or start-up, this section serves to collect data for insights out of the main scope of application.

Professional Activity (multiple choice): **Administration/Manager/Consultant/Expert/Advisor/Other....**

How familiar are you and your organisation with the Strategic Environmental Assessment (SEA) instrument (multiple choice)?

- Only with the SEA objective;
- Only with the SEA process;
- There has been involvement in SEA;
- Not familiar at all.

Who is responsible for applying Strategic Environmental Assessment (SEA) in your organisation? (please specify the role inside the company). (short answer text).

Can you identify a case in your organisation where Strategic Environmental Assessment (SEA) was applied? (short answer text).

According to the case mentioned above and others developed in your organisation, please describe the importance of the following potential advantages that SEA bring to your organisation's strategic approach to sustainability and investment projects? (score from 1 – totally disagree to 5 – totally agree, and 6 - I do not know!):

**SEA allowed the integration of environmental and/or social information to project's development processes.;**

**SEA helped with the establishment of priorities early-on the process.;**

**SEA contributed to alter the vision of the plan mid/long-term.;**



**SEA contributed to the discussion and definition of strategic options of development.;**  
**SEA promoted the engagement and the contribution of the public and other sectorial entities.;**  
**SEA helped the planning team in learning and innovating processes.;**  
**SEA had a fundamental role to the attainment of the Sustainable Development Goals in the organisation.;**  
**SEA produced information that was used by planners in the review and discussion of changes.;**  
**SEA allowed to alter decision-makers mindsets and vision in relation to future developments.**

In your opinion, what do you consider to be the most relevant strategic criteria that a Strategic Environmental Assessment must follow to address PPPs (plans, projects and programmes)? (long answer text).

From the following, which are the main difficulties for an organisation to apply a Strategic Environmental Assessment (SEA) (check-boxes)? **Clarity of the legislation/SEA guidance useful and sufficient/Capacity of the public to contribute to SEA/Collaboration between entities for decision-making/Motivation of entities to enhance SEA/Planning practices to integrate SEA/Other...**

How familiar are you and your organisation with the SDGs (Sustainable Development Goals)? (score from 1 – not familiar at all to 5 – Full acknowledgment).

Which SDGs (one or more) have been/are being addressed by your organisation? (short answer text).

Which were the instruments used to address those Sustainable Development Goals (SDGs) (check-boxes)? **Strategic Environmental Assessment (SEA)/Environmental Impact Assessment (EIA)/EU Sustainable Taxonomy/ESG Criteria/Our organization does not address any SDG./Other...**

According to the instruments used, the organisation was/is being successful to attain the proposed Sustainable Development Goals (SDGs) (multiple choice)? **Yes/No/Organisation is not involved with a strategy to comply with the SDGs and Agenda 2030.**

Please evaluate how much do your organisation consider the following aspects within its strategy/instruments used in the attainment of the Sustainable Development Goals? (score from 1 – not considered at all to 5 – fundamental to the company, and 6 - I do not know!):

**Administration/Management support to any of these tools.;**  
**Stakeholder involvement to project's development processes.;**

**Early-on analysis of environmental and social impacts from the proposed plan/project.;**  
**Late consideration of environmental and social impacts on the proposed plan/project.;**  
**Proactive and efficient communication between all internal and external stakeholders/employees.;**  
**Motivation to innovate and search for sustainable solutions within the company and its entrepreneurial initiatives.;**  
**Strategic approach to the company projects and everyday tasks.;**  
**Importance of the public consultation and participation to obtain feedback.;**  
**Vision and mission convergence between employees and managers.;**  
**SEA's practice and mentality.;**  
**EU Sustainable Taxonomy Compliance.;**  
**ESG Criteria.**

In your opinion, what is the most common difficulty that may impede an organisation to be successful in the attainment of the SDGs? (long answer text).

Do you have any comments/suggestions about how strategic thinking instruments, such as, the Strategic Environmental Assessment (SEA), had a role on the attainment of specific Sustainable Development Goals (SDGs), monitored by your organisation, or PPPs involved with? (long answer text).

### **A.1.6 Demographic data**

This final section is only for contextualisation and statistical framing of the sample.

What is your age (multiple choice): **18 to 25/25 to 35/35 to 50/50+/Prefer not to answer..**

What is your gender? (multiple choice): **Male/Female/Prefer not to answer./Other....**

What is your ethnic background? (multiple choice): **Caucasian/Asian - Eastern/Asian - Indian/Hispanic/African - American/Native - American/Mixed race/Prefer not to answer./Other....**

In which continent do you live? (multiple choice): **North America/South and Central America/Europe/Africa/Asia/Oceania/Prefer not to answer./Other....**

What is your religion? (multiple choice): **Protestant/Catholic/Mormon/Orthodox/Jewish/Muslim/Buddhist/Hindu/Atheist/Agnostic/Prefer not to answer./Other....**

What is your education level? (multiple choice): **Elementary school/High school/Bachelor/Master/Doctorate/Prefer not to answer./Other...**

Which languages are you capable of speaking fluently? (check-boxes): **English/Spanish/Portuguese/French/Mandarin/Arabic/Prefer not to answer./Other...**

What is your employment status? (multiple choice): **Full-time/Part-time/Unemployed/Unable to work/Prefer not to answer./Other...**

What is the level of your annual household income? (multiple choice): **Less than 15,000€/15,000€ - 30,000€/30,000€ - 50,000€/50,000€ - 100,000€/More than 100,000€/Prefer not to answer./Other...**

What is your nationality? (short answer text).

### **A.1.7 Thank you for the participation!**

Have a nice day and hope you enjoyed this questionnaire.



# B

## **Additional Tables**

**Table B.1:** ST4S approach to SEA and differences to the traditional approaches (source: [1])

	ST4S in SEA	Conventional SEA
Object of assessment	Strategic options in relation to its opportunities and risks for sustainability.	PPP proposals and its alternatives to mitigate environmental (and social) effects.
Positioning	Proactive to PPP conceptualization (formation and formulation of strategies).	Proactive to formal decision on PPPs adoption, but reactive to PPP conceptualization.
Driver	Construction of sustainable futures drawing on the added-value created by natural and social capital, and helping to choose the enabling strategic options.	Integration of environmental issues through analysis and mitigation of the environmental and social effects of proposals.
First things first	Prioritize socio-political strategic issues first to then inform.	Inform technically on relevant environmental (and social) issues first to then prioritize.
Problem analysis	Mostly root causes seeking problem structuring.	Mostly observable symptoms seeking problems solution.
Relation to decision	Continually interact with policy- and plan-making cyclic processes in assessing strategic decisions to enable more sustainable development contexts.	Advice to decision-making on how PPP (or multiple projects) can improve environmental outcomes and what are how to mitigate effects.
Assessment	Based on backcasting led by the awareness of a desired future, with a vision and long-term objectives.	Based on predictions or forecasts built on past evidence, modelled assumptions and anticipated changes.
Participation and engagement	Dialogues with relevant stakeholders to build sustainable futures (priorities, options, opportunities and risks, recommendations).	Public participation for consultation of views and concerns.
Motivation	Create space for opportunities, contexts for development to be sustainable.	Provide environmental information to decisions and report.


**Table B.2:** REN's act4Nature commitments and monitoring indicators (source: [13])

SMART Individual Commitments *	Monitoring Indicators	Start   End Date
Developing a strategic plan for integrating biodiversity into the company's activities	Strategic plan for integrating biodiversity into the company's activities published on the company's website	2020-2022
Integrating task forces (TF), work groups (WG) or other equivalent within the scope of biodiversity and ecosystem services	Participation in TF/WG/other equivalent	2020-2021
Establishing local, regional or global partnerships in projects that have a significant impact on biodiversity (e.g., LIFE) to solve specific problems in line with the company's strategic plan.	Partnerships and corresponding results	2020-2022
Carrying out/collaborating in sectorial actions to raise awareness regarding Biodiversity, sharing knowledge and good practices adopted.	Carried out and promoted sectorial actions in the area of biodiversity	2020-2022
Considering the development of an easement-corridor management document to maximise biodiversity and ecosystem services	Published guidelines for ecological management and good practices. Good practices implemented	2020-2022
Identifying the bird species most affected by collisions with REN's lines	Report and scientific communications	2020-2022
Carrying out an inventory of the biodiversity present in the supports and in the easement corridors	Results of the inventory published	2020-2022
Establishing a partnership with CIBO-University of Porto to continue the collaboration initiated in 2015, within the scope of the REN Chair on Biodiversity, seeking to implement a programme of biodiversity research and mitigation of impacts generated by the company	Investment in ES&B research programmes (to be integrated in the calculation of the indicator: investment in ES&B/GVA)	2020-2022
Ensuring the monitoring or participation of entity/entities and/or specialist(s) in ecology, biology or related sciences, in projects in which their involvement is deemed necessary and an added value to defining and implementing actions that contribute to reducing or mitigating impacts	Projects carried out with teams specialised in ecology, biology or related sciences and their results	Ongoing

**Table B.3:** REN's act4Nature commitments and monitoring indicators (continuation) (source: [13])

Investing in the creation of ecological corridors where they are ecologically relevant and within the scope of the infrastructure managed by the company	Investment in ecological corridors / total investment in nature conservation	2020-2022
Participating in public consultations related to and impacting biodiversity and ecosystem services (e.g., National Strategy for Nature Conservation and Biodiversity)	Public consultations in which the company participat	Ongoing
Implementing compensatory measures in situations where the impacts cannot be minimised	Area (ha) and/or Investment (euros) of the implemented compensation measures	Ongoing
Raising employee awareness, namely by raising awareness about the importance of biodiversity and ecosystem services	Number of employees who participated in awareness-raising activities	2020-2022
Promoting employee knowledge, through their participation in environmental volunteering activities or in carrying out local biodiversity inventories	Number of employees who participated in environmental volunteering activities	Ongoing
Training employees in good environmental practices to be applied in the company's operations, specifying the contribution to biodiversity	Percentage of employees trained in good environmental practices	Ongoing
Fostering the development and implementation of initiatives by employees in favour of biodiversity	Number of employees who participated in biodiversity initiatives	2020-2022
Investing in projects of scientific entities or other stakeholders that seek nature conservation	Investment in projects of scientific entities for nature conservation (to be integrated in the calculation of the indicator: investment in ES&B/GVA)	2020-2022
Reporting, annually, in the clearest and most transparent manner possible, the progress in meeting individual commitments	Section for reporting on the evolution of act4nature commitments in the annual sustainability report	Ongoing

**Table B.4:** Fundação's Galp targets for Agenda 2030 (source: [8])



**Sustainable energy and biodiversity protection**  
To promote the development of communities through the access to energy and to contribute to the preservation and enhancement of the planet's natural resources

**Sustainable energy and natural resources protection**  
**Until 2021**


- **Enabling access to renewable energy in rural areas of Mozambique** | Ensure electricity to 123 infrastructures (public lighting, schools, health units and domestic homes); around 6,000 Mozambicans impacted; estimated reduction of 54 tonnes of CO<sub>2</sub>/year
- **Clean energy for cooking in Guinea Bissau and Mozambique** | +220,000 inhabitants; +100 thousand hectares of deforestation avoided; +530 thousand tonnes of CO<sub>2</sub> avoided

**Reforest and promote the preservation of biodiversity**  
**Until 2021**


- **500,000 native species of trees planted** in Portugal, with the potential of 42.5 kton CO<sub>2</sub> sequestered over the next 30 years

**Target in 2025**

- +20,000 Mozambicans impacted in community development programs for biodiversity protection
- +280 Mozambicans impacted in coral reef conservation initiatives



950 beneficiary entities



**Education and Knowledge**  
To promote the access to inclusive and quality education, entrepreneurship and social innovation


**Construction and improvement of basic infrastructures (classrooms, libraries, sports facilities)**  
**Until 2021**  
29 infrastructures completed.  
**Target in 2025**  
Achieve 100 new infrastructures in African countries.

**Access to education and promotion of equal opportunities**  
**In 2021**  
7,736 people impacted; 3,200 computers and other technologic devices provided; 1,065 Scholarships  
**Target in 2025**  
Plus 39,171 people impacted


**Training and skills development within the scope of energy and sustainable development**  
**Impact in 2021** — since 2010 up to 2021

- + 2.0 million students and teachers impacted
- + 17,070 schools
- + 5,000 energy classes

(In 2021, 38,899 students & teachers and 824 schools)  
**Target in 2025**  
Plus 100,000 students & teachers and 1,845 schools.



1,503 thousand direct beneficiaries



**Social Emergencies**  
To support communities in unexpected situations, through humanitarian aid, in cooperation and partnership

**Social support and humanitarian aid**  
**Impact in 2021**


- + 1,452,764 people helped

**COVID 19 | Food emergency response**  
**"Every step counts" challenge, "one kilometer, one meal"**

- 2.2 tons of goods (food & water purifiers) distributed in 9 locations in Sofala Province, Mozambique.
- 1,100,000 people received meals assistance in Portugal
- 500 orphan children received support in Eswatini
- 1,000 families in Brazil received meals assistance

**Displaced Communities in Cabo Delgado, MZ**  
**Target 2021/2022**

- Provision of Fuel for the vehicles on the terrain and LPG for the kitchen in order to help in the confection of food for the IDPs affected by the conflicted in Cabo Delgado | 300,000 direct & indirect beneficiaries, with Makobo platform NGO
- Access to quality education, nutrition and women empowerment. Construction of classrooms & restoration of damaged infrastructures due to the armed conflict in the region | 3,674 direct beneficiaries (students, teachers); +10,277 indirect beneficiaries, with Helpo NGO and Camões Institute
- Activation of Community and Institutional Networks for the Protection of Displaced School-age Children and Young People - Miéze | 25,582 beneficiaries (students, teachers), with Helpo NGO and Camões Institute



797 volunteers, 1,298 h of volunteering

**Table B.5: Galp's Strategy to Attain the SDGs (source: [8])**

Community investment policy principles	Sustainable development goal
<b>Energy</b>	<b>SDG 7</b> - Ensure access to affordable, reliable, sustainable and modern energy for all
<b>Health and social well-being</b>	<b>SDG 1</b> - End poverty in all its forms everywhere <b>SDG 2</b> - End hunger, achieve food security and improved nutrition and promote sustainable agriculture <b>SDG 3</b> - Ensure healthy lives and promote well-being for all at all ages
<b>Education and training</b>	<b>SDG 4</b> - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
<b>Environment and energy efficiency</b>	<b>SDG 6</b> - Ensure availability and sustainable management of water and sanitation for all <b>SDG 13</b> - Take urgent action to combat climate change and its impacts <b>SDG 14</b> - Conserve and sustainably use the oceans, seas and marine resources for sustainable development <b>SDG 15</b> - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss
<b>Social innovation</b>	<b>SDG 5</b> - Achieve gender equality and empower all women and girls <b>SDG 8</b> - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all <b>SDG 9</b> - Build resilient infrastructure, promote inclusive, sustainable industrialisation and foster innovation <b>SDG 10</b> - Reduce income inequality within and among countries <b>SDG 11</b> - Make cities and human settlements inclusive, safe, resilient and sustainable <b>SDG 12</b> - Ensure sustainable consumption and production patterns <b>SDG 16</b> - Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
<b>Engagement with stakeholders</b>	<b>SDG 17</b> - Strengthen the means of implementation and revitalize the global partnership for sustainable development



**Table B.6:** Shell's Environmental Performance Data (source: [9])

## OTHER ENVIRONMENTAL DATA

### Air emissions [A]

	Unit	2021	2020	2019	2018	2017	IPECA	SASB	GRI
<b>Acid gases and VOCs</b>									
Sulphur oxides (SO <sub>x</sub> )	Thousand tonnes	<b>32</b>	36	65	74	81	ENV-5	EM-EP:120a.1	305-7
Upstream	Thousand tonnes	<b>4</b>	4	15	19	24	ENV-5	EM-EP:120a.1	305-7
Integrated Gas	Thousand tonnes	<b>2</b>	3	4	4	2	ENV-5	EM-EP:120a.1	305-7
Downstream	Thousand tonnes	<b>26</b>	29	47	51	55	ENV-5	EM-EP:120a.1	305-7
Other	Thousand tonnes	<b>0</b>	0	0	0	0	ENV-5	EM-EP:120a.1	305-7
Nitrogen oxides (NO <sub>x</sub> )	Thousand tonnes	<b>105</b>	118	108	111	107	ENV-5	EM-EP:120a.1	305-7
Upstream	Thousand tonnes	<b>55</b>	60	40	41	44	ENV-5	EM-EP:120a.1	305-7
Integrated Gas	Thousand tonnes	<b>14</b>	12	13	10	9	ENV-5	EM-EP:120a.1	305-7
Downstream	Thousand tonnes	<b>36</b>	46	55	58	53	ENV-5	EM-EP:120a.1	305-7
Other	Thousand tonnes	<b>1</b>	0	1	2	0	ENV-5	EM-EP:120a.1	305-7
Volatile organic compounds (VOCs)	Thousand tonnes	<b>45</b>	47	55	59	95	ENV-5	EM-EP:120a.1	305-7
Upstream	Thousand tonnes	<b>17</b>	17	17	25	42	ENV-5	EM-EP:120a.1	305-7
Integrated Gas	Thousand tonnes	<b>8</b>	8	15	6	7	ENV-5	EM-EP:120a.1	305-7
Downstream	Thousand tonnes	<b>21</b>	22	23	29	46	ENV-5	EM-EP:120a.1	305-7
Other	Thousand tonnes	<b>0</b>	0	0	0	0	ENV-5	EM-EP:120a.1	305-7
<b>Ozone-depleting emissions</b>									
CFCs/halons/trichloroethane	Tonnes	<b>0.0</b>	0.0	0.0	0.0	0.0	ENV-5	-	305-6
Hydrochlorofluorocarbons (HCFCs)	Tonnes	<b>2</b>	6	8	9	7	ENV-5	-	305-6

[A] Split by business may not add up to total due to rounding.

Table B.7: Shell's Social Performance Data (source: [9])

## SOCIAL PERFORMANCE DATA

### Social

	2021	2020	2019	2018	2017	IPECA	SASB	GRI
<b>Our people</b>								
Employees (thousand)	82	87	87	82	86	-	-	102.7
Training days for employees and joint-venture partners (thousand)	271	234	373	315	425	SOC-7	-	-
<b>Gender diversity [A]</b>								
Employees overall (% women)	33	32	31	31	32	SOC-5	-	405-1
Graduate hires (% women)	48	49	48	46	49	SOC-5	-	405-1
In supervisory/professional positions (% women)	34.3	33.1	30.8	29.9	29.1	SOC-5	-	405-1
In management positions (% women)	27.2	25.5	24.5	23.7	22.3	SOC-5	-	405-1
In senior leadership positions (% women)	29.5	27.8	26.4	24.0	22.2	SOC-5	-	405-1
Executive Committee (% women)	25	12.5	12.5	12.5	12.5	SOC-5	-	405-1
Board of Directors (% women)	50	38	42	45	36	SOC-5	-	405-1
<b>[i] Staff forums and grievance procedures</b>								
% countries with staff access to staff forum, grievance procedure or other support system	100	100	100	100	100	SOC-12	EM-EP-210a.3	103-2
<b>[i] Child labour (% countries with procedures in place)</b>								
Own operations	100	100	100	100	100	SOC-4	EM-EP-210a.3	408-1
Contractors and suppliers	100	100	100	100	100	SOC-4	EM-EP-210a.3	408-1
<b>[i] Forced labour (% countries with procedures in place)</b>								
Own operations	100	100	100	100	100	SOC-2	EM-EP-210a.3	409-1
Contractors and suppliers	100	100	100	100	100	SOC-2	EM-EP-210a.3	409-1
<b>Integrity</b>								
Code of Conduct violations [B]	181	216	263	370	261	GOV-1	EM-EP-540a.2	102-17
<b>[\$] Contracting and procurement</b>								
Estimated expenditure on goods and services in lower-income countries (\$ billion) [C] [D]	4.2	4.5	5.7	4.1	4.9	SOC-14	-	204-1
<b>[\$] Social investment [E]</b>								
Estimated voluntary social investment (equity share) (\$ million)	94	156	116	113	111	SOC-13	-	203-1
Estimated social investment spend (equity share) in lower-income countries (\$ million) [F]	72	87	84	102	107	SOC-13	-	203-1

**Table B.8: Sustainable Development Plan 2020-2024 - 12 Strategies (source: [14])**

Strategy	Target	2021 Results
<b>Governance</b>		
1 Make sustainability principles integral to our governance, operations and projects	1.1 Integrate sustainability principles into our corporate guidelines	Sustainability principles integrated into 39% of our policies and directives (11/28).
	1.2 Earn public recognition for our leadership in responsible governance	ISO 37001 certification and three new recognitions obtained.
2 Do business with responsible suppliers	2.1 Identify and apply occupational health and safety requirements to risk-sensitive work categories	Health and safety selection criteria defined and implemented in several pilot requests for proposals. Contractual requirements drafted for three key hazards for the company.
3 Significantly improve our occupational health and safety performance while fostering employee wellness	3.1 Obtain ISO 45001:2018 health and safety certification by 2023	Process of obtaining ISO 45001:2018 certification 20.3% completed.
	3.2 Implement or showcase health and wellness initiatives	36 health and wellness initiatives implemented.
4 Offer an inclusive work environment that reflects Québec's diversity and rally our employees around sustainable development	4.1 Continue to improve equal access to employment by raising target group representation	28.5% women (2020: 28.5%), 1.6% Indigenous people (2020: 1.6%), 2.0% ethnic minorities (2020: 1.9%), 7.7% visible minorities (2020: 6.8%), 0.7% people with disabilities (2020: 0.6%)
	4.2 Increase target group representation in management positions	26.6% women (2020: 26.0%), 1.1% Indigenous people (2020: 1.0%), 1.2% ethnic minorities (2020: 0.9%), 4.4% visible minorities (2020: 3.5%), 0.4% people with disabilities (2020: 0.5%).
	4.3 Implement a sustainability awareness program that promotes employee engagement	Sustainability awareness program promoting employee engagement 40% implemented.
	4.4 Launch an action plan for disabled groups	Progress on 48 commitments Completed: 14 (29%) In progress: 28 (58%) Pending: 6 (13%)

**Table B.9: Sustainable Development Plan 2020-2024 - 12 Strategies (continuation) (source: [14])**

Strategy	Target	2021 Results
<b>Community</b>		
5 Foster Québec's development as a society through our financial contribution	5.1 Contribute \$23.4 billion to Québec's gross domestic product (GDP) by 2024	\$22.7 billion contributed to GDP (2020: \$20.5 billion). <sup>a</sup>
6 Build and operate sustainable, resilient infrastructure while adapting our activities to climate change	6.1 Implement a climate change adaptation plan by 2021	Development and submission of a climate change adaptation plan: 100% completed.
	6.2 Expand the integration of sustainability principles in infrastructure projects	Two impact assessments completed.
	6.3 Obtain or maintain BOMA BEST certification for targeted administrative buildings and rented office premises of over 1,000 m <sup>2</sup> in Montréal and Québec	BOMA BEST certification for 21 buildings and premises: 100% obtained.
7 Generate more sustainable value in the community	7.1 Develop indicators and optimize certain programs to maximize their social and economic benefits for the community	Progress on the two programs in question [Integrated Enhancement Program (IEP) and Social Responsibility Directive]: 50% completed.
8 Take steps to include Indigenous peoples and encourage their input into our development	8.1 Obtain Silver-level certification from the Canadian Council for Aboriginal Business's Progressive Aboriginal Relations (PAR) program	Silver-level PAR program certification obtained.
<b>Environment</b>		
9 Work toward decarbonizing all of our business activities and markets	9.1 Avoid 4.6 Mt CO <sub>2</sub> eq. of emissions through our long-term export contracts	2.5 Mt CO <sub>2</sub> eq. of GHG emissions avoided (2020: 2.5 Mt CO <sub>2</sub> eq.). <sup>a</sup>
	9.2 Cut direct emissions of our operations by 35% by 2027	Not available. <sup>b</sup>
	9.3 Aim for carbon neutrality by 2030	Development of a detailed plan of action for the strategy aiming for carbon neutrality by 2030: 100% completed.
10 Equip Quebecers to lower their consumption through better electricity use	10.1 Propose electricity management solutions to our business and residential customers that aim to cut energy use by 2.49 TWh and potentially reduce power demand by 1,523 MW compared to 2019	Energy use by business and residential customers cut by 0.733 TWh (2020: 0.4427 TWh) Potential reduction in power demand of 438.7 MW (2020: 327 MW) <sup>b</sup>
11 Enhance and protect biodiversity	11.1 Develop a corporate strategy for enhancing and protecting biodiversity	Plan of action postponed to 2022 as a result of the global health situation and its impacts on the adoption of new government strategies to enhance and protect biodiversity.
12 Reduce resource use by applying the principles of the circular economy	12.1 Draft and deploy a logistics strategy that applies the best practices of the circular economy	Logistics strategy: 17% of measures implemented.
	12.2 Use tools to integrate total cost analysis (TCA) of goods and services at the time of procurement into our governance	Five total costs of ownership determined in 2021 for contracts with a total annual value of \$17,484,545.

a) Preliminary result (9 months actual/3 months projected). The final figure will be published in the *Sustainability Report 2021*.

b) The final figure will be published in the *Sustainability Report 2021*.

c) Result not available. The final figure will be published in the *Sustainability Report 2021*.



