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Decarbonization of customers, creating a desirable and sustainable future in the energy sector

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1. INTRODUCTION

Regarding transition towards sustainability, an increasing number of researchers consider that one of the major challenges for organizations is to create futures which are desirable enough to bring change in management practices (Gümüşay and Reinecke, 2022). Climate change embodies one of this major challenge as it brings uncertainty and complexity challenging our ability to foresee and manage the future (George et al., 2016). If this growing concern about climate change has led to the rise of a plurality of ways in which organizations engage with the future, most of them still need to be studied thoroughly to advance organizations studies (Wenzel et al., 2020). Rindova and Martins (2022) have expanded this literature, studying how organizations can engage with the future designing persuasive narratives. But the role of management instruments – such as devices and tools – in the process of designing attractive futures requires further investigation.

In this paper, our main research question will be to understand how organizations can use management instruments to design desirable futures, especially in the energy sector regarding the challenge of climate change. To handle this question, we have chosen to carry out a single case study (Eisenhardt, 1989) in a leading company of the energy sector, analyzing the design process of a management tool for “decarbonization of customers”: how to account for the “positive” impact of the energy company on their clients’ carbon footprint/emission. We analyze the process by which this company starts to set up “future-making” practices (Wenzel et al., 2020) through narratives and management instruments to build up performative real utopias (Gümüşay and Reinecke, 2022).

2. FROM DESIRABLE FUTURES TO FUTURE-ORIENTED MANAGEMENT INSTRUMENTS: A THEORETICAL OVERVIEW

2.1. Creating a desirable future, the role of imaginaries

Grand challenges such as climate change have created new and complex issues (Ferraro et al., 2015; George et al., 2016) that have pushed organizations to reconsider the ways they engage with the future. As traditional strategy planning activities have been encountering their limits, organizations have developed numerous methods to produce and enact desirable futures (Wenzel et al., 2020), leading to the emergence and growth of future-making practices.

Future-making involves contemplating the temporal perspective of the future and understanding how envisioned futures are brought to life and materialized, instead of imagining a future scenario then reconstructing the necessary pathways to reach that outcome (Thompson & Byrne, 2022). Building on the “sociology of expectation”, Skjølsvold (2014) introduces a distinction between translative and transformative futures, explaining that translative futures are usually mobilized for desired technology or policy trajectories, while transformative a more nuanced and progressive approach, thereby transforming the practical, symbolic, and cognitive significance of the potential trajectories of a technology in the future.

Imaginary represents one of the most powerful ways to produce alternative futures. Castoriadis (1997) has already shown that imaginary can transform structures and institutions of human societies. He distinguishes two components of imaginaries, which he calls instituted and instituting. The instituting imaginary can produce, thanks to the creative capacities of human collectives, new meanings that destabilize existing historical forms. This instituting imaginary ultimately makes it possible to produce an instituted imaginary that embodies these meanings in material elements such as tools or techniques, and immaterial elements such as language, standards, or laws.

According to Ricœur (1984) our societies are shaped by a social imaginary whose expression might take forms of utopias produced to deliver alternative ways of thinking. The social imaginary shares with the individual imaginary the characteristic of being based on a tension between two integrative (ideology) and subversive (utopia) poles; it is in fact a double imaginary polarized by a fundamental conflict between two opposing forces: ideology and utopia.

Some researchers point out that, in general, the efforts required to build a new socio-technical future feed on utopian visions of social progress (Kröger & Maestrutti, 2018).

Built up out of collective imaginaries, utopias are developed to create attractive and desirable futures. Utopias play fundamental roles in the structuring of imaginaries, and consequently, in the changes, evolutions and transformations of human societies. But they have their limits as they are essentially impossible to achieve. The question that arises is therefore to know how organizations can seize on these utopias to design desirable and accessible futures

2.2. Materializing utopias through future-oriented management instruments

One possible approach to materialize desirable futures is to develop real utopias positioned between dreams and reality, combining visions of the future and dispositions of the present (Wright, 2010). Real utopias are interesting because they can inspire us a better world, helping us imagine what should come next and design an accessible and desirable future (Gümüşay and Reinecke, 2022). Materializing this potential future implies building up performative real utopias having the capability to transform society (Gümüşay and Reinecke, 2022). The concept of performativity refers to the ability of a theory or idea to transform society in accordance with its predictions (Cabantous et al., 2010).

The performative power of instruments and their role in shaping organizational practices has been already established (Le Breton & Aggeri, 2019). Instruments refer to artefacts such as tools, devices, or narratives (Aggeri, 2014). Berry (1983) describes management tools as an “invisible technology”, with a preponderant role in the decision-making process. Muniesa et al. (2007) proposed a similar approach based on “market devices” to study how markets can be intentionally shaped. Even if studies relative to the role of instruments in the strategic future-oriented thinking have still to be expanded, several researchers have already emphasized the importance of certain categories of instruments. This is for instance the case for narratives and discourses, whose significance and performative capabilities have been verified in previous research (Garud et al., 2014).

Rindova and Martins (2022) have focused on future-oriented narratives, showing that designing real utopias can be part of a strategic activity using narratives to design “futurescapes”, representing potential futures organizations want to materialize to get strategic

advantages. The performative power of these futurescapes relies on a narrative building process combining what the authors refer to as productive imaginative on the one hand and creative imagination on the other hand. While productive imaginative aims at underlining the plausibility of a possible future, creative imaginative is mobilized to design fictions questioning our taken for granted knowledge.

Other researchers have emphasized the socio-materiality of future-making practices relying on instruments such as management devices and tools. Esguerra (2019) sets forth the role of “future objects” such as tools ready to use (databases, power point...), experimental infrastructure for creating futures and collectively or iteratively worked objects (engineering prototypes, negotiation texts of global environmental agreements). Building on a longitudinal analysis of a strategic foresight tool, Idoko et al. (2021) propose the notion of “activation device” and conclude that this tool does not just describe the world or a future state but actually takes part in its creation. They argue that there are four ways that such a tool is performative: enrolling, temporalizing, consolidating, and persuading. From a more general perspective, Skjølsvold (2014) reckons that tools have a regulative role enacting the importance of political decisions to bring future visions to life or prevent undesirable outcomes.

When it comes to climate change, numerical modeling and calculation tools represent key instruments to set directions and seem necessary to orient collective action towards a low carbon future. Scenarios regularly published by the IPCC are built on quantitative analysis methods defining the targets to be reached in terms of greenhouse gases emissions mitigation. Analysing the notion of Net-zero 2050 future, Nadaï et al. (2023) used the concept of “qualculation” (Callon & Law, 2005) referring both to quantitative and qualitative activities carried out by various actors to qualify, calculate and assess the value of a good; to analyze the construction process and performativity of a low carbon scenario. They demonstrate that the performativity of modeling is brought into tension between two ways of assembling the future: unifying outcomes in terms of quantities or multiplying visions through qualitative and relational understandings. Eventually, they conclude that the outcome of this performative process remains uncertain, but the question of the required conditions for materializing the initial vision stays open.

3. METHODOLOGY

3.1. Decarbonization of customers at Engie

Climate change and the transition towards sustainability is a grand challenge (Ferraro et al., 2015; George et al., 2016) for the energy sector, which is both a carbon intensive sector and a great lever for decarbonization. We chose to focus on a company in the energy sector, engaged in this sustainable transition. We have decided to perform a single case study (Eisenhardt, 1989), selecting a leading company with the will to achieve carbon neutrality and to drive the market towards sustainable practices.

Our investigation will be focused on Engie, a French leading energy provider. Engie is an international group which underwent various reorganizations to remain competitive within a changing energy market. It is now organized in four Global Business Units (GBUs), each specialized in a pool of activities: GBU Renewables for the large renewable energy production assets; Networks for the gas and electricity networks; Energy Solutions for the smaller infrastructures and the energy services (maintenance, etc.); and Flex Gen & Retail for the non-renewable energy production. These GBUs are complemented by two specialized operational business lines in charge of the nuclear activity and the energy management and sales. All these entities are supported by the corporate, comprising e.g., the Corporate Social Responsibility (CSR) department, the Strategy department or the Research & Innovation department (Figure 1).

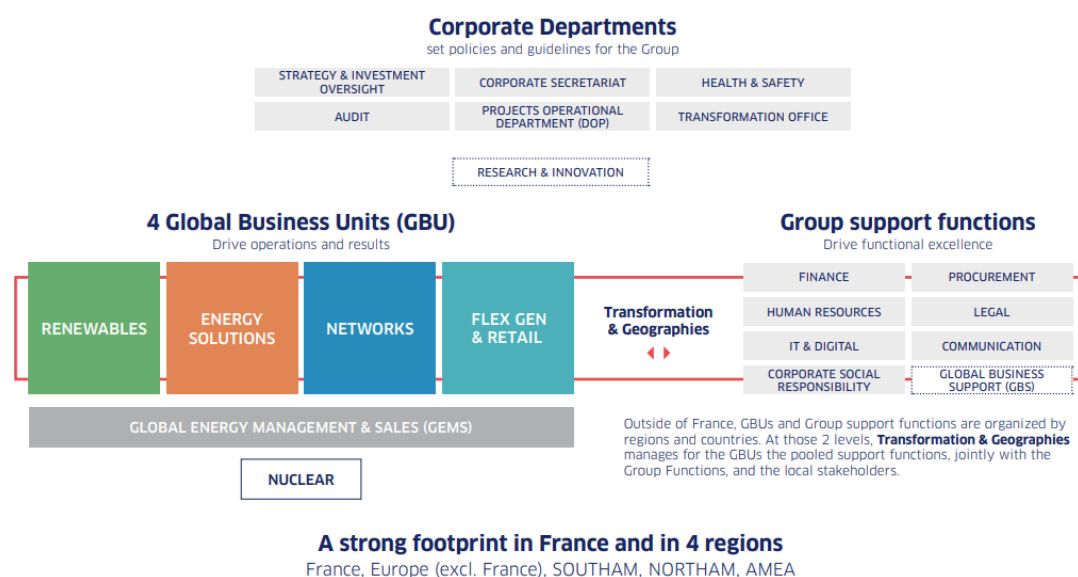


Figure 1 Engie's organization (An organization to grow further, Engie - 2023)

Engie’s purpose – included in its bylaws in 2020 – is *“to act to accelerate the transition towards a carbon-neutral economy, through reduced energy consumption and more environmentally-friendly solutions. The purpose brings together the company, its employees, its clients and its shareholders, and reconciles economic performance with a positive impact on people and the planet. Engie’s actions are assessed in their entirety and over time.”*. To operationalize its purpose, it has been developing a management tool to account for its “positive” impact on its clients’ carbon footprint, referred to as “decarbonization of customers”.

The decarbonization of customers¹ (DoC) is considered to occur when Engie’s products and services are utilized to decrease or prevent greenhouse gas emissions of its customers (such as industrials, governments, organizations, local communities, individual customers or households). A perimeter of Engie’s activities participating to DoC has been made prior to the development of the calculation methodology (Table 1). The measurement compares the amount of greenhouse gas emissions avoided when using one of Engie’s products or services with a chosen baseline scenario.

Products/Services	Explanation
Green Power Production	Owning and/or operating assets using renewable resources (solar, wind offshore, wind on shore, hydro, geothermal, biogas, biomass and renewable hydrogen)
Green Gas Generation	Owning and/or operating assets to generate green gas (biogas or renewable hydrogen)
Onsite Generation	Owning and/or operating assets producing heat, cold, power on a client’s site
On site Cogeneration or Trigeneration	Owning and/or operating assets producing at least two of the following outputs heat, cold power on a client’s site.
District Heating & Cooling	Owning and/or operating assets and infrastructure to produce heat or cold
Mobility	Owning and/or operating green mobility assets and services, green vehicles.
Public Lighting	Owning and/or operating lighting assets and infrastructure
Installations	Installing materials, assets, equipment and infrastructure (energy generation assets, public lighting, mobility assets, building retrofits, mechanic and electrical equipment, heating and cooling, residential solar, energy storage systems)
Operations & Maintenance	Services of maintenance and/or operation for energy savings improvements.
Purchasing & Sales of Green Power, gas, heat	Selling green energy (electricity, gas, biomass or heat) purchased from suppliers (external or other Engie entities)
Financing or Purchasing and Sales of white certificates	Supporting customers to earn energy efficiency certificates under a White Certificates Scheme.

¹ Decarbonization of Clients and Decarbonization of Customers have been used indiscriminately by Engie to refer to the same process. In this article, we chose to use Decarbonization of Customers.

Financing or Purchasing and sales of carbon certificates	Selling carbon credits from regulatory markets to customers
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Table 1 Engie's product and services to decarbonize its customers (adapted from DoC Accounting Guidelines Summary, Engie Impact 2020)

Two uses are possible: reporting or prospecting. Reporting consists in measuring at the end of one year the amount of “avoided emissions” of ongoing projects and operated infrastructures. Propecting consists in estimating the avoided emissions of future projects, to compare different scenario and have an overview of the project’s impact.

3.2 Data collection

Data were collected during an immersion inside the company, as at least one member of the research group had a position of PhD in the company. Preliminary data were collected from September 2020 to December 2021, via semi-directive interviews and documents. The semi-directive interviews were conducted with key stakeholders of the project – a member of the steering committee validating the tool and an interviewee in charge of deploying the tool within its operational units – focused on the design of the management tool and the processes set up by the company to make it performative. To complement these interviews, internal communication on the development strategy set up within the company were analyzed. Public documents communicating on the tool could also be accessed. The study of such a process requires a rich set of data to confront various perspectives and levels of analysis (Langley and Tsoukas, 2016). In 2023, we conducted a new set of 14 interviews focused this time on the Decarbonization of Customers’ strategy, from its development to its deployment (Table 2). All the interviews lasted from 35 minutes to 1:15 hour.

Code	Entity	Function	Date	Focus
I1	Global Business Line Solutions	Carbon / CSR officer	09.09.2020	Deployment of CO2-related tools for the decarbonization strategy
I2	CRIGEN (R&I department)	Head of the Environment & Society research lab	19.11.2021	Deployment if the carbon neutrality strategy
I3	CRIGEN (R&I department)	Head of the Environment & Society research lab	14.03.2023	Development of Decarbonization of Customers (DoC)
I4	GBU Energy Solution	CSR officer	17.03.2023	Development of Decarbonization of Customers (DoC) and deployment in GBU Energy Solution
I5	Engie Impact	Analyst	23.03.2023	Re-alignment process of Engie’s DoC methodology with WBCSD’s standards
I6	CSR department	Former DoC project leader at Engie Impact	27.03.2023	History of DoC

I7	Engie Impact	Leader of Engie's DoC methodology revision	28.03.2023	Re-alignment process of Engie's DoC methodology with WBCSD's standards
I8	GBU Energy Solutions	Marketing department	29.03.2023	Deployment of the calculation tool OSCAR for avoided emissions at the project level
I9	Engie Retail (B2C)	CSR officer	30.03.2023	Deployment of DoC in Engie Retail and development of alternative methodology
I10	Engie Impact	Former leader of the DoC methodology development project	31.03.2023	History of DoC
I11	GEMS	CSR officer	19.04.2023	Deployment of DoC in GEMS and development of alternative methodology
I12	GBU Flex Gen & Retail	CSR officer	19.04.2023	Deployment of DoC in GBU Flex Gen & Retail and development of alternative methodology
I13	GBU Energy Solutions	Project leader – contact point for DeClic	19.04.2023	Deployment of DeClic, the DoC calculation tool for business developers
I14	Engie Retail (B2C)	Marketing department	24.04.2023	Development of an alternative avoided emissions calculation and decarbonization projects
I15	GBU Networks	CSR officer	03.05.2023	Deployment of DoC in GBU Networks and development of alternative methodology
I16	GBU Energy Solutions (Engie Solution France)	Sales representative	11.05.2023	Use of OSCAR in projects

Table 2 List of the interviews

During this second stage, we also collected internal data related to the design and deployment process of this management tool. This set of data, allowed us to delve into the narratives around the management tool – through official internal and external publications – and the practices – through actors' interviews from the decisional levels to the operational ones.

3.3. Data Analysis

The majority of interviews (13 out of the 16) were conducted in pairs, offering advantages in note-taking and avoiding the omission of important questions. Having two researchers present during the interviews reduced misunderstandings and enhanced idea generation. A quick reflection was done right after the interview to summarize key points, note down startles, and capture verbal and non-verbal prompts. All the recordings of the interviews were shared with a third researcher, external to the company. The DoC process was discussed and confronted with him. The objective was to gain both from the richness of the data and the external posture of the third researcher.

To analyze data, we have built on process studies, using a mix of sense-making strategies like narrations – to make a problematized description of the tool development –, temporal bracketing – to structure different phases in the development process – or visualization – to link the different phases with other dimensions, like stakeholders, and parallel processes of influence (Langley, 1999).

4. RESULTS – DECARBONIZATION OF CUSTOMERS, A THREE-STEP PROCESS

The project Decarbonization of Customers (DoC) was a work stream of a larger project “Engie Carbon Neutral” (also named “Engie Net-Zero”). Engie Carbon Neutral was launched in the mid-2019. It was presented as a transversal transformation project to accelerate the company’s decarbonization (Figure 2).

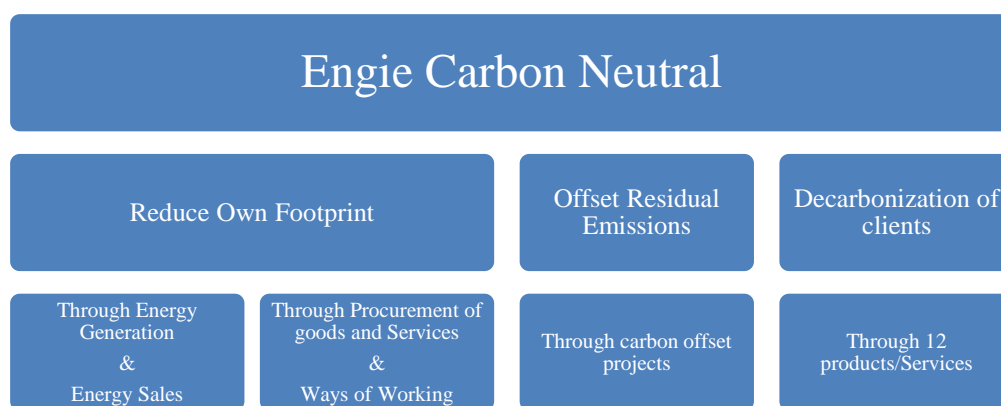


Figure 2 Engie Carbon Neutral Work Streams (adapted from Accelerating Decarbonization of Energy Sector , Engie Impact 2021)

Engie Impact, a specialized consulting entity within Engie, and expert on the subject of decarbonization, was in charge of the project. The project was part of a bigger dynamic, as Engie was also involved in several external initiatives, like the French Net-0 Initiative. In the following narration, we will present three phases of the DoC process. First, an internal development phase occurred during 2020. Second, we notice a transition and communication phase in 2021. Finally, we argue that Engie has entered a phase of global appropriation since 2022 (Figure 3).

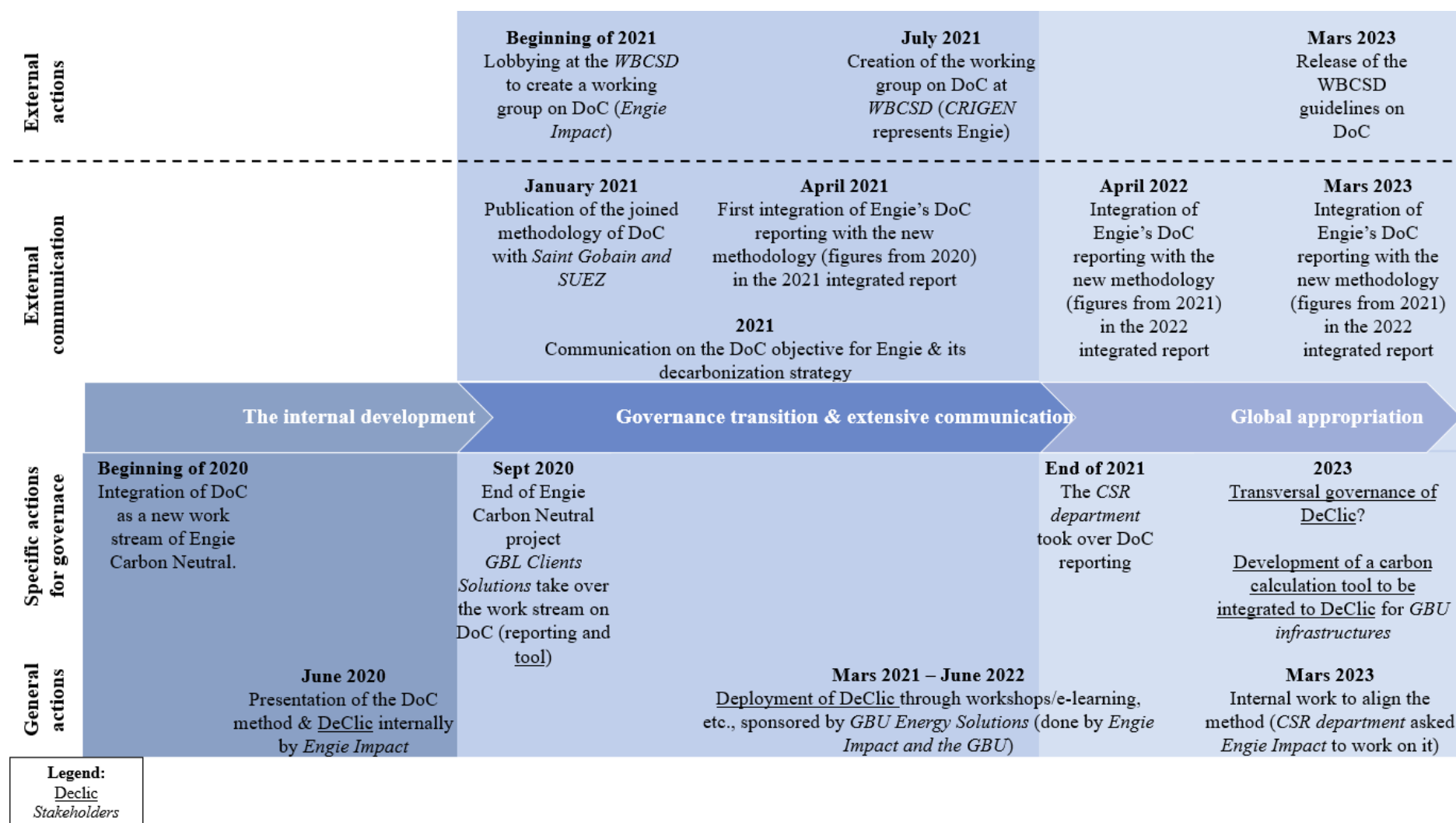


Figure 3 The DoC process (the authors)

4.1. The internal development of a management tool

In the beginning of 2020, Engie's executive committee added the decarbonization of customers (DoC) to the Engie Carbon Neutral's agenda. Initially, DoC was imagined as a communication tool. It participated in materializing Engie's new purpose through quantifiable arguments. DoC, was envisioned as a support for Engie's new narrative: "leader of the energy transition". I10 mentioned that Engie's executive committee saw DoC as a way to make its purpose credible and accountable for. Engie's core business is in the energy sector, and its purpose relies heavily on carbon accounting. Carbon accounting on the company's carbon footprint, which is mandatory, is based on acknowledged global standards. However, as mentioned by I3, I6 and I10, no standards existed on DoC. There was a stake – highlighted by most interviewees – in creating a sound methodology, that could be the base of future global standards. The objectives were twofold: 1) develop an accounting and reporting methodology - legitimated by external actors - to measure Engie's participation in its client's decarbonization; 2) develop a tool based on the principles of this methodology, to be used at the project level to forecast the avoided emissions allowed by the project.

The first step of the DoC work stream was to define a method to account for "avoided emissions", or "customers decarbonization". Based on a literature review, an assessment of existing initiatives both internally and externally, the team at Engie Impact was able to define the basic principles of a methodology applicable to the energy sector mid-2020. They also worked on the perimeter on which these principles could be applied, defining 12 activities within Engie considered as "decarbonizing". The work done by Engie Impact was discussed and validated with an operational committee composed of members of the different operation units, representatives of the CSR department and the CRIGEN (a research entity within Engie).

Once these principles were validated internally by the steering committee (comprising e.g., representatives from the strategic department and members of the operational committee), the workflow was divided in three: gaining external legitimation, deploying the reporting process and developing a tool for business developers. Engie Impact was in the lead of the three subjects until the end of 2020 which marked the end of the project Engie Carbon Neutral. Once the project stopped, a new governance was set up for each workflow.

4.2. Governance transition and extensive communication

2021 was a transition year when it comes to the governance: each work stream of the transversal project Engie Carbon Neutral was devolved to an operational entity. The Global Business Line Client Solution (GBL Client Solution, currently GBU Energy Solution) took over the deployment of the DoC reporting and the development of a digital calculation tool for projects. As Engie Impact was the resource entity on DoC, most of the training sessions were still done by Engie Impact, but sponsored by the GBL Client Solution.

2021 was also a communication year, with the public communication of Engie's objective to reach 45 million tons CO₂eq avoided by 2030 along with its decarbonization strategy written by Engie Impact (Engie Impact, 2021). In April, the first DoC reporting based on the figures from 2020 was integrated into Engie's integrated report (Engie, 2021).

Engie Impact also remained involved for the external legitimization of the methodological principles. To make DoC a global methodology, they tried to gather interested parties early in the process. The objectives were to validate the principles of the methodology and make joint communications. According to I10, the group in charge of developing the method did a benchmark of the actors engaged in such process, and the strategic actors to convince. They reached out to several companies – Suez, Saint-Gobain – actors engaged in carbon standards – WBCSD, WRI, Afnor – or labels – Solar Impulse Foundation – and expert organizations – the Ademe. With the interested stakeholders, they held workshops to discuss the methodology and jointly published the core principles in January 2021. Going one step further, Engie Impact presented the methodology in the project SOS 1.5 held by the WBCSD. They also lobbied, along with other organizations, to launch a working group on developing an international methodology to calculate avoided emissions. When the working group was launched – mid-2021 – the CRIGEN was involved in all the discussions as a major support. They participated to present their internal methodology. Then they surveyed the development of the methodology established by the WBCSD, to ensure Engie's principles were coherent with the international framework developed. Even though the final global guidelines are produced by an independent advisory group with contributors from the WBCSD and Carbone 4, Engie is acknowledged in the report as co-initiator of the process (WBCSD and Net Zero Initiative, 2023).

4.3. Starting a global appropriation?

2022 can be considered as the beginning of a global appropriation step in the process of unlocking the performativity of DoC. In 2022, the governance of the reporting was taken by the CSR department. The process became more formalized, by assigning carbon managers in each entity to be in charge of gathering the data. This DoC reporting is now in the process of integration to other existing reporting tools within the company. The aim is to facilitate information collection and exchange. On the other hand, the global deployment of the digital tool for business developers encountered several obstacles. The Global Business Unit Energy Solution (GBU Energy Solution, former GBL Client Solution) remained the main sponsor and started to develop it within its entity, with training sessions for its business developers. However, this appropriation of the tool faced some challenges. For instance, the complexity of the notion, the accessibility of the tool, the perimeter of the tool or the existence of other calculation sheets developed by specific teams were highlighted by interviewees. Nevertheless, the GBU Energy Solution made the decision to include the DoC indicator as requirement for all projects presented in the investment committee. This mandatory calculation facilitated the deployment of the calculation tool. The other GBU were at first less involved and proactive in the process of deploying the tool within their entities. The only obligation of calculation was for the projects presented to the group investment committee.

In 2023, the WBCSD communicated on its global guidelines for DoC. The CSR department thus delegated to Engie Impact the work to re-align Engie's methodology with the international standards. This work is done through regular workshops and meetings with the different carbon representatives of the entities, and with the support of the CRIGEN. It relies mainly on the network created around the reporting process. In parallel, the entities are starting to appropriate DoC in projects: the tool should soon get a transversal sponsoring from the entities, and some are developing additional functionalities more aligned with their activities.

All in all, DoC and its derivative tools strengthen the narrative of Engie being a leader of the energy transition. Most interviewees expressed a feeling that Engie was "expert" on carbon subjects, and that this expertise was being recognized externally. I10 mentioned how Engie's implication in the creation of DoC methodology helped build its position of advisor to other organizations. I8 stated that the support of some expertise entities, like Engie Impact or the CRIGEN, allows the operational unit to benefit from the "group's rigor". Similarly, I16

underlined the importance of internal carbon calculation tools when discussing with clients, as it adds to Engie's credibility.

More than creating a new narrative around its desirable future role as energy transition leader, Engie had a stake to build credibility around its narrative. In a sector of calculation standards, they engaged in a process of creating a management tool to account for the decarbonization of customers, and to launch a standardization dynamic around their methodology principles. It allowed them to gain an expert position, both from internal and external stakeholders, and participate in performing its narrative.

5. INTEGRATION OF FUTURE-MAKING PROCESS IN THE ORGANIZATION – AN ANALYSIS OF PERFORMATIVITY

DoC was a first step into future-making. The main purpose of the DoC development was not to have an immediate impact on the portfolio of Engie's activity. The objective set for 2030 will almost certainly be reached and no mechanisms to act on the activities through DoC have yet been set up. From the interviews with the stakeholders, we found that DoC currently serves for two purposes: 1) setting an inventory of Engie's activities regarding decarbonization and 2) creating a culture of carbon. Through this process, Engie is building its expertise on the subject of DoC, creating some workflows around carbon and communicating a new narrative around its activities.

On the one hand, the reporting became a standardized process, relying on representatives of each entity and soon integrated into the global reporting processes of Engie. The reporting is supervised by the CSR department. In each GBU, the CSR representative is in charge of gathering the yearly figures of avoided emissions and forward them to the CSR department. The indicator is then consolidated by the CSR department before being communicated in the Integrated Report. All these stakeholders and experts from Engie Impact and the CRIGEN are working on the new DoC methodology and its deployment.

On the other hand, the integration of the tool for business developers (DeClic) did not rely on an explicit workflow. There is no obligation of use – except for huge investment projects, or identified representative. Each entity needed to appropriate the subject and allocate resources for its deployment. A strong difference from entity to entity, depending on their

needs, interests and activities, can be noticed. For instance, the GBU Energy Solutions was the most dynamic in the deployment of the digital tool, organizing training sessions and setting mandatory calculation of avoided emissions for most projects. I4 explained that this interest come from the need to valorize the activities of the GBU (mostly services related to the energy), which are not performing well on usual indicators. However, interest also starts to grow around this tool, leading to its deployment and specification (based on the need of a CSR representative, as presented by I15), its integration into existing processes (I13 mentioned linked being developed between DeClic and other tools) or the development of alternative calculations. These alternative calculations can be developed to answer clients' demands – or a need for communication – by the marketing teams (according to I4, I8, I9 an I16) or to meet specific project teams' requirements (as mentioned by I12 for hydrogen or batteries). The global digital tool, is either considered too complex (I14), or not precise enough (I11) depending on the use cases.

All in all, the integration of DoC inside the organization seems to be a preparatory step preceding a more active future-making process, which could engage with Engie's activities. The formalized workflow created around the reporting tool would facilitate the setting up of more constraining management tools – like quota for avoided emissions. On the other hand, the calculation tool for business developer was less appropriated by the operational teams, but revealed some bottom-up work to design alternative calculation tools. This decentralized workflow seems disconnected from the top-level strategy for DoC, but participates in deploying the DoC narrative around Engie's activities with clients and developing internal expertise on carbon reporting.

6. DISCUSSION – CREATING THE FUTURE AND TRANSFORMING MANAGEMENT PRACTICES

Although DoC seems to be only an initial step in a longer process, this research has allowed us to highlight the significance of management instruments in future-making, especially in the context of an energy sector being pressured to advance its transition towards a low carbon future.

The role of management instruments in future-making and utopia materialization

Advancing previous work on futurescapes (Rindova & Martins, 2022), we show that management instruments such as carbon accounting and reporting, are necessary to support the development of performative narratives regarding climate change. The main difference with the case of technological development analyzed by Rindova and Martins (2022), is that climate related issues are highly normative and exposed to risk of greenwashing accusations, explaining the importance for DoC to rely on standardized and widely recognized tools.

This normative pressure of quantitative analysis in carbon accounting has been built and is continually reinforced by regular publications from recognized actors such as the IPCC or The SBTi (Science Based Targets initiative). It opens an avenue for the development of highly sophisticated instruments built by numerous experts to support the legitimacy of the narratives built around climate issues.

In this context, quantitative and qualitative activities set up to carry out a 'qualculation' process (Nadaï et al., 2023; Cochoy & Law, 2005) and enact the performative effect of these narratives laid the foundation for a future-making process involved in the materializing of the low carbon utopia rooted into Engie's narratives.

Conditions to change management practices

The narrative built by Engie around DoC seems to be a relevant example of real utopia (Gümüşay and Reinecke, 2022), combining a desirable future (low carbon future) with real activities and material emerging from the present. Nevertheless, as mentioned by Nadaï et al. (2023), the question of the conditions required to transform management practices from such a performative process still has to be precised. Even if the 'qualculation' process set up by Engie has allowed to build a narrative and initiate the adoption of a new carbon-friendly culture, at this point, we cannot be sure that operational teams will fully adopt this vision and culture to change their practices accordingly.

Climate change is a specific grand challenge (George et al., 2016) pushing organizations to change the way they engage with the future (Wenzel et al., 2020). We have emphasized the performative power of a 'qualculation' process in the design and adoption of future scenarios and narratives, along with its potential in climate-related future-making activities, especially in

the sector of Energy. It could be interesting to conduct further research in other industrial sectors and study the similarities and differences with the mechanisms observed in our case.

7. CONCLUSION

With this process, we see that Engie engages in the development of a narrative, to build a collective imaginary of a desirable future, going beyond planning and risk management practices. This process is both internal – through the development of a strategy for the decarbonization of customers – and external – through the legitimation and spreading of this narrative. To support and perform this desirable future, Engie participates in the design of future-oriented management instruments that can take the form of indicators, guidelines or calculation tools. They both shape and perform the desirable future of customers' decarbonization. The implementation of these instruments requires organizational work both within the boundaries of the company and outside it.

The analysis of future-making process we propose in this paper can be used to conceptualize the process through which a company mobilizes a diversity of actors and instruments to design a performative real utopia (Gümüşay and Reinecke, 2022). This conceptualization is especially interesting to analyze change dynamics in the field of Energy where organizations are pushed to tackle climate change issues. Therefore, our research contributes to advancing the growing literature about strategic activities developed by organizations to design a sustainable future (Wenzel et al., 2022).

Besides, extending the research performed by Rindova and Martins (2022) about future-oriented narratives developed by companies to shape the future, we highlight the significance of management instruments, analyzing how organizations can combine narratives, devices and tools to set up future-oriented management instruments to design and materialize desirable futures. Our study emphasizes that even if traditional risk and planning management does not meet the constraints of a more complex and uncertain future, some traditional tools such as indicators, can be effectively mobilized and included into more complex instruments to deal with the unknown.

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