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Title page for “Vitiden: Transforming a Policy-Orienting Scenario to a Practice-Oriented Energy Fiction”

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Abstract

There is a lack of futures studies addressing consumption and lifestyles at the level of everyday life. This article reports on the transformation of the policy-orienting scenario "Legato", developed by the Swedish Energy Agency in 2016, to a practice-oriented design speculation. The article describes the process of transformation and the resulting energy fiction "Vitiden". The transformation involved three acts of translation. First, the scope of the transition was explored in-depth, both quantitatively and qualitatively, providing a more detailed understanding of the gap between the 'sustainable' 2050 and today. Second, the scenario Legato was analysed for practices and elements of practices that could be elaborated to descriptions of how everyday life could play out in this future. The third step involved re-presenting the practice-oriented scenario as a design speculation. The design speculation was given the form of a book named "Vitiden - an energy fiction" in which the re-formulated version of Legato is presented through text and images, combining a forward-looking manifesto and a backward-looking future archaeology. Besides the written content and the pictures and illustrations of Vitiden, the design of the book is also part of the speculation as it embodies an exploration of how publications, including form, graphic design and choice of materials, could look like in a future such as Legato.

Keywords: speculative design; energy fiction; sustainable futures; social practices; energy system analysis

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1. Introduction

"What you are now reading is unlike everything else you have previously seen from the Swedish Energy Agency. Our study "Four Futures" provides a starting point for a modern energy dialogue. It is a dialogue that adopts a holistic approach, a societal transition and demonstrates the importance of properly navigating the energy transition."

(Energimyndigheten 2016a: 4, translation by authors)

In March 2016 the Swedish Energy Agency [Energimyndigheten] published a report with the title "Four Futures: The Energy System Beyond 2020" (Energimyndigheten 2016a). The report describes the results of an explorative futures study aimed at exploring a number of different ways the Swedish energy system could develop, including possible consequences for transports, housing, industry and the environment. In the report a total of four scenarios are presented, each representing a specific set of societal trends and priorities translated into energy system configurations and societal structures. The four scenarios are named after music terms – Forte (meaning forceful), Legato (meaning tied together), Espressivo (meaning expressively) and Vivace (meaning lively). In Forte, economic growth and, consequently, low energy prices for the industry are prioritized, while in Legato, ecological sustainability and global solidarity are at the core of society. In Espressivo, energy production and use are the

focus of a kind of conspicuous consumption, and in Vivace, energy is seen as a springboard for ecological modernisation.

A common trait for all four scenarios is that they take a comprehensive approach to energy. Rather than addressing the energy system as a siloed issue, it is related to both material and social aspects of society at large. Apart from energy system characteristics, the four scenarios elaborate on the design of cities, the production focus of industries, and how (and where) people live, work and transport themselves. In the report the scenarios are re-presented in a variety of ways, including both qualitative and quantitative descriptions. The quantitative representations mainly include diagrams of different kinds (but no data sets) through which the size and composition of the future energy system are described. The qualitative representations include text-based descriptions of how the future societies work, structured across six headings: spatial planning, lifestyle and housing, industry, transport, energy supply, and, policy instruments. The qualitative representations also include narratives, one per scenario, in which e.g. a glimpse into the life of a lorry driver portrays a future with hybrid electric lorries, electric roads, smart travel planners and a thriving countryside.

Besides the report there are also four short YouTube-movies (in Swedish) in which the scenarios are portrayed by snapshots of how a day-in-life could look like. At the report launch event, the scenarios were also presented in a small exhibition with a showcase for each scenario re-presented through music and images (from the report) and also orally by a person telling visitors about the scenario. The way the Four Futures is represented is interesting since energy related scenarios in Sweden, as in many other parts of the world, have traditionally tended to be developed at macro-levels of society, typically addressing questions of energy production, distribution and use in quantitative terms and reported through diagrams and numbers, i.e. what Manzini and Jegou (2000) call Policy-Orienting Scenarios (POS). Even though, the Four Futures does comprise more qualitative elements, the report is still strikingly missing representations of everyday life. Certainly, there are a number of lifestyle changes mentioned, but as in many other futures studies these are described from the birds-eye-view of planning and policy, e.g. there are descriptions of car-free cities and how these came about, but not of how everyday life could be when living in a car-free city.

Another aspect of the report relating to representation is its visual style. It is clear that quite some effort has been put into making the report easy to navigate and read. Each scenario has its own colour and font, and infographics are used extensively together with tables and diagrams. The report makes heavy use of stock photos portraying symbols of nature such as drops of water, green leaves, blue skies. This is contrasted with symbols of technological achievements such as factories, green electricity production and speedy trajectories of something unknown passing by – perhaps a reference to infrastructure. It does not portray any actual situations or real lived life, including its grittiness. All pictures of humans portray them in solitariness, with faces averted, and often at a distance.

Fig. 1. A page from *Four Futures: The Energy System Beyond 2020*, exemplifying the visual style of the report.

In the preface to the Swedish version of *Four Futures* report the Director General writes: “*If we get the opportunity in the future we would love to come back and develop our work with scenarios to better prepare ourselves for the future. Of course, together with all of you interested in Sweden’s energy system and societal development.*” (Energimyndigheten 2016a: 5, translation by authors). We decided to take this ambition literally and develop what we felt was missing – a re-presentation of the future that takes its starting point in the activities of everyday life, and that invites to reflections and debate also for those who are not used to (or interested in) reading and interpreting reports. Such scenarios, where one or more futures are explored at the level of everyday life, would by Manzini & Jegou (2000) probably be labelled a Design-Orienting Scenario (DOS), but we have instead chosen to use the term *practice-oriented scenario* (pos)¹, to emphasise that our focus is exploring practices per se, rather than supporting innovations in and by design, which is the focus of DOS. By translating the more general notions of policy to possible consequences for and in terms of everyday life, including both the living environment and interconnected practices, we seek to make the political in the nitty-gritty of everyday life more explicit and thus open to scrutiny and debate.

The dual aim of this article is to report on the process by which the policy-orienting scenario Legato was transformed to a practice-oriented scenario, and to report on the result of this transformation and re-presentation – the design fiction Vitiden. The more overarching aim of the project, to create more accessible representations of energy scenarios, is accompanied by initiating an inquiry into the possibilities and limitations of shifting from the more general scenario perspective to a practice-oriented design fiction. Better understanding of such translations can be valuable to future projects seeking to explore the connections between new (actual or imagined) policies and future lifestyles and practices that could accompany them, to benefit policy-makers and public.

¹ Lowercase letters used to distinguish from Policy-Orienting Scenarios (POS).

2. Theoretical framing

2.1 Sustainable lifestyles and sustainable practices

For more sustainable futures to become possible, extensive changes to systems of production and consumption are necessary. We know that technical solutions are not enough, but that sustainable development demands substantial cuts in, and redistributions of consumption. We also know that in order to change behaviours in sustainable directions, we need to consider the contexts and situations, in and through which behaviours are embedded and performed (Jackson 2005; UNEP 2016).

UNEP (2016, p. 3) defines a 'sustainable lifestyle' as "a cluster of habits and patterns of behaviour embedded in society and facilitated by institutions, norms and infrastructures that frame individual choice, in order to minimize the use of natural resources and generation of wastes, while supporting fairness and prosperity for all". To be able to encourage people to embrace more sustainable lifestyles it is thus necessary to first understand influencing factors, such as institutions and infrastructures, and how individuals relate to, and create connections with these. For this purpose, social practice theories are a helpful tool. Social practice theories see that an individual's 'lifestyle' can be defined as the set of social practices embraced by the individual, including any emergent properties of these practices. Drawing on the conceptualisation of social practices developed by Shove and colleagues (Shove et al. 2012; Shove & Pantzar 2005), all social practices entails three elements: stuffs (material aspects), skills (knowing- and capacity-related aspects), and image (stories which make sense of, legitimize or rationalise these practices, also see Giddens (1991)). In the face of this model, it is however important to emphasise that (many) social practice theories are integrative, departing from a flat ontology, and are thus more useful for deconstructing, collapsing or opposing categories (such as skills, stuff and image) than to identify and re-establish them. When practices are performed, notions of social and material, macro and micro, here and elsewhere, are collapsed. To use (a simplified account of) the practice of cooking dinner as an example, this collapses social norms of what a dinner is, including temporal and spatial aspects, with material conditions of body, equipment, machinery, ingredients, and time available. In a country such as Sweden, cooking dinner also involves collapsing here (the kitchen, the supermarket) with elsewhere (where crops are grown and/or processed), and in so also collapses the micro (everyday life) with the macro (globalised capitalism). Yet, for the purpose of analysis categories such as 'social' and 'material', or 'stuff', 'skill' and 'image', can still be useful.

Using practices as the unit of analysis reveals other and new possibilities for policy making. A social practice approach changes the focus from seeing (and treating) people as individual decision-makers, driven by (a bounded) rationality, to addressing them as skilful social negotiators (Shove et al. 1998; Spaargaren 2003). To understand lifestyles, practices and related patterns of consumption it is thus key to appreciate what people perceive as the (their) normal ways of doing things, and how these 'normal' and ordinary routines are maintained, evolve and/or change over time (Shove 2004). The reproduction of practices is carried out through engaging with socio-material artefacts and systems, i.e. practices are scripted and structured by technologies (ibid.; Akrich 1992). Furthermore, Shove (ibid.) suggests attention to be paid to the dynamics of practices, how and why they develop, in order to understand how to promote less resource demanding practices. Here, Kuijer et al. (2008) see a possible role for design, to use it as a tool, not only to design new products for existing practices, but to design artefacts that suggest or support the emergence of new practices-to-be, so called 'proto-practices'. Such innovations in practice depend on "the active integration of elements,

some new, some already well established, that together constitute what we might think of as innovations-in-waiting or proto-practices” (Shove & Pantzar 2005, p. 48). Proto-practices are hard to identify except in hindsight, when they no longer are ‘proto’, but one contemporary example of a practice still in waiting (in Western countries) could be growing insects for food at home. Through developing prototypes of artefacts relating to desired (e.g. more sustainable) proto-practices, these future practices can be made present (in the dual sense of the word), and experienced, examined and rehearsed (Kuijer 2014; Halse et al. 2010). Furthermore, this can be related to the understanding of practice as performance and performative; through testing and rehearsing a new way of doing, initial barriers can go away or be overcome and the new practice can be ‘normalised’ (Kuijer 2014).

For this project our main interest was however not only in ‘new’ proto-practices, but also in existing practices that in one way or another defies the mainstream. Drawing on Levitas’ (2013, p. 165) notion of interstitial utopias as “*places where a better life can be built even in the face of the dominance of [hegemonic ideologies]*”, we conceptualise these as *interstitial practices* and define these as *practices that are based in and contribute to the production of alternative economies and counter-narratives*. Indeed, in many situations it is difficult and probably often also irrelevant to make a clear distinction between an interstitial practice and a proto-practice. Both concepts are to some extent relational – what is an interstitial practice for one person might be a proto-practice for someone else. However, both interstitial practices and proto-practices need to be experienced, examined and rehearsed to be ‘normalised’ (Kuijer 2014) and adopted by a larger group of people. For this purpose, futures studies provide a useful tool, as it allows for explorations of and encounters with alternatives.

2.2 Futures studies & speculative design

Futures studies is a broad field of research and practice that aims to develop, examine, assess and suggest futures (Bell 2003:73). The futures studies literature often distinguishes between three different ways of thinking about the future; thinking in terms of predictions, thinking in terms of eventualities, and thinking in terms of visions (Dreborg 2004), each responding to and resulting in a specific type of scenario – probable, possible and preferable futures, respectively (Bell 2003). A related typology is presented by Börjeson et al. (2006) who recognise three main types of futures studies, based on what type of question the scenario is intended to answer – *predictive* scenarios are aimed at responding to the question ‘what will happen?’, *explorative* scenarios are aimed at responding to the question ‘what could happen?’, and *normative* scenarios are aimed at responding to the question of how a specific could be met.

The usefulness of futures studies rests on the understanding of the future as open and on the appreciation of a critical social-constructivist perspective on what futures are seen as probable, possible and preferable. The future is open because, according to a Western and secular line of thought, it does not exist, leaving it outside the scope of observational descriptions (Bell & Olick 1989; Karlsen et al. 2010). An open future implies two things of relevance to anyone seeking a specific future over others. First, the openness of the future makes it possible to influence, providing a *raison d’être* for planning, policy-making, social movements, and other future-oriented endeavours. Second, a future that is open is impossible to control and predict. The future is thus the realm of simultaneous expectation and uncertainty. In relation to this, futures studies work as ‘learning machines’ (Berkhout et al. 2002) through which expectations and uncertainties can be explored in a structured way. This is particularly the case for explorative and normative futures studies, as these seek not to predict the future but aim at a better understanding of uncertainties, ambiguities and choice,

and to render short- and long-term consequences of policy-making and technological development explicit. Scenarios can also support a process of un-learning and re-learning (Robinson 1988; Robinson 2003), and be a vehicle for de-familiarising and re-politicising that which was previously taken for granted and normalised. In other words, scenarios can alter expectations of futures and presents alike, including what futures are seen as probable, possible and preferable. This is a useful capacity in a time when, to paraphrase Jameson (2007), ‘it is easier to imagine the end of the world than an end to the fossil fuel driven economy’. Scenarios alter expectations through adding to our ‘field of experience’ (Koselleck 2004), i.e. all that which we have experienced, direct or indirect. This field of experience is constitutive to our ‘horizon of expectation’, i.e. what which we can expect, (ibid.), however the translation of experiences into expectations does not necessarily take place in a direct way, but can include all sorts of tweaks and remixes. In other words, our experiences can be recombined to create expectations, also of things we have not yet experienced, by the help of our imagination.

2.2.1 Related research

There has been a lack of scenarios addressing consumption and lifestyles at the level of everyday life (Wangel 2011; Neuvonen et al. 2014), particularly from a social practice perspective (Doyle & Davies 2013). However, in the last decade or so, there has been an increased interest in, and acknowledgement of, the importance of exploring futures also ‘bottom up’. An early example is the SusHouse project which explored three household practices (or ‘functions’) including clothing care, housing (‘shelter’), and food (Green & Vergragt 2002; Vergragt 2000). More recently, the SPREAD 2050 project extended a backcasting study of infrastructural changes to also include an exploration of sustainable lifestyles (Neuvonen et al. 2014; Leppänen 2012). This project also involved ambitious work on representing the suggested future lifestyles through timelines, shorter and longer narratives, and movies (all found at www.sustainable-lifestyles.eu). Similar to this, but building on an already existing backcasting study of a sustainable Stockholm in 2050, and to a more limited extent, the Prototyping the Future project sought to re-present the backcasting study at the level of everyday life through developing an interactive experience of how life might be like in this future (Ilstedt & Wangel 2014, also see www.life2053.com). Davies and Doyle (2015) reported on a HomeLab project in which practices of home heating, personal washing, and eating were explored and re-imagined through a practice-oriented participatory (POP) backcasting process. This project resulted in the invention of a number of ‘promising practices’.

The last years have also witnessed an increased experimentation with ways to re-present scenarios, essentially blurring disciplinary boundaries that were previously seldom crossed (at least not in research). Alternative futures are now increasingly explored through speculative architecture, design fictions, and a variety of artistic and interactive practices such as theatre (Bendor et al. 2017), literature (Schneider-Mayerson 2017; Williams 2018) and art exhibitions (f.ex. “Welcome Back” by Swedish designer Katja Pettersson, (see www.katjapettersson.com/WELCOME-BACK)). This is a most welcomed development as it holds the potential of increasing the availability of alternative futures across societal groups, as well as of increasing the possibility of people becoming engaged by, and in, the future. This latter possibility is perhaps easiest explained through the maxim “nothing in the mind that was not first in the senses”, which seems to suggest a value in representing scenarios in ways that engages us bodily. This does not necessarily imply creating full-sized 3D representations with sounds, smells and tastes, but rather points to the importance of

representing futures not as abstract(ed) transitions, but as lived realities supporting people's ability to enter into other places, times, bodies and conditions.

There is however a field of futures studies in which material speculation is key. In speculative design and architecture possible futures are explored through prototyping artefacts and situating these in life-like settings as *"a sort of speculative ethnography: a way in which to explore and evaluate practices and assemblages which do not yet exist, or which exist only as outliers."* (Raven 2017, p.). Through presenting a speculative 'what if' future, such as an interstitial practice scaled up, 'as if' it was real, the border between what is perceived as fiction and what is 'real' becomes thinner, and what was previously seen as impossible can become possible, or even preferable (Broms et al. 2017). The design speculations thus work as a kind of 'future archaeology': *"Just as archeologists describe societies based on the artifacts left behind, we can describe societies in terms of more or less fictional artifacts – and conversely, identify the artifacts that would enable us to realise a desired society"* (Dahlbom 2002, p.35). The field of speculative design and architecture includes several useful examples of how to explore alternative futures at the level of practice. Three examples where energy production and use stand in focus will be mentioned here. The project Energy Futures (Mazé et al. 2013), part of the program SWITCH! (Mazé 2013; Mazé & Redström 2008) developed scenarios telling stories of transformed lifestyles through the design of a number of artefacts, including 'socket bombs', 'energy forecasts', and 'voluntary blackout zones'. One specific characteristic of this project was that it presented the artefacts as 'real fictions', i.e. pretending them to be real, but (so far) happening in small scale and/or in other parts of the world. The Underdome Guide to Energy Reform portrays 48 stylized and typologised ways to organise housing and related energy production and use (Kim & Carver 2015), connecting practices to architecture, urban planning and governance (although not fleshing out practices to any larger degree). In Sensing Energy (Broms et al. 2017) design-driven research was used to explore and represent how a sustainable energy system could manifest in an urban environment, should sustainability be defined as a matter of sufficiency rather than efficiency.

The project presented in this paper builds on this young yet rich tradition of material speculation on energy issues, and seeks to contribute to its development primarily in three ways: first, through suggesting the concept of interstitial practices as fertile ground for future making, second, through an ambition to include a plurality of looks, feels, voices and perspectives when representing the future, and third, through including also the 'output', i.e. the book and its design in the exploration and re-presentation the future.

3. Research process

3.1 Selecting Legato

Because of limitations of time and other resources we decided to select one of the Four Futures scenarios to work with. Since we were particularly interested in exploring sustainable futures rather than futures in general we decided to go for the scenario with the lowest level of energy use and greenhouse gas emissions (GHG). Not surprisingly this turned out to be *Legato*, i.e. the scenario characterised by a societal priority of ecological sustainability and global solidarity.

Once we had selected Legato the process of transforming this to a practice-oriented design speculation included three acts of translation.

3.2 Translation 1: Setting a consumption based carbon budget for Legato

The reason for analysing the energy use and GHG emissions in the scenarios was to provide a basis for understanding the magnitude of the transition needed. While the Swedish Energy Agency had made some estimates of the GHG emissions for each scenario these proved to be based on a system definition that was inconsistent with the core values of Legato (i.e. global solidarity), and essentially non-supportive of a study in which everyday life was in focus.

3.2.1 Defining the energy system

The system definition in the Four Futures study follows the Swedish Energy Agency's standard definition of "the Swedish energy system", which includes all production (conversion) of energy and all direct use of energy within the territorial borders of Sweden (see Fig 2). This is what is usually called a *territorial* system definition and is used as point of departure when the Swedish Energy Agency makes an estimate of GHG emissions for the Four Futures scenarios.

Fig. 2. The different system definitions. Territorial system definitions to the left in blue. Consumption based system definition to the right in orange.

According to the Swedish Energy Agency, the Swedish energy system cannot contribute with more than 10 Mton CO₂(e) annually by 2050, for Sweden to contribute its share to meeting the 1.5 degree target of the Paris agreement (Energimyndigheten 2016a: 123), a target that is only met by Legato and Vivace (Figure 3, see the left bar for each scenario).

Fig. 3. GHG emissions from the four futures, including the reference year 2014. The left bar for each scenario shows the emissions from “the Swedish energy system”, i.e. a partial territorial system boundary. These are the emissions included in the Four Futures. The right bar for each scenario shows what the emission levels would look like should a consumption based allocation approach be used. These calculations are made by the research team.

While a territorial system boundary has a clear benefit in its connection to formal policy-making, it comes at the cost of disregarding all GHG emissions that are not coming from other sources than energy production and direct energy use in Sweden, such as emissions from e.g. grazing animals and land use in Sweden as well as emissions related to energy embodied in imported goods and resources. Since the qualitative descriptions of the Four Futures scenarios include more than energy production and direct energy use, this system definition also causes inconsistencies in the Four Futures scenario study as a whole. The reference (baseline) year in Four Futures is set to 2014 and reports 40 Mton of GHG emissions (CO₂(e)) from the Swedish energy system. According to the Swedish EPA [Naturvårdsverket], who looks at all territorial GHG emissions from Sweden, total territorial emissions for 2014 amounted to 54 Mton (Naturvårdsverket 2017a). Thus, while we can conclude that considerable part (74 %) of the Swedish territorial GHG emissions come from the Swedish energy system, the GHG emissions included in Four Futures are clearly underestimated (Figure 3, see the right bars per scenario, and also see Figure 4).

Fig. 4. Swedish GHG emissions per system definition. All data for 2014. Sources: Naturvårdsverket 2017a; Naturvårdsverket 2017b; Energimyndigheten 2016a.

Moreover, with Legato being characterised by global solidarity concerns, it can also be argued that the territorial system definition should be replaced by a consumption based system definition. A consumption based system definition changes the basis of allocation from focusing on territorial emissions to focusing on domestic consumption and emissions related to this, no matter where emissions take place. Consumption based emissions are typically calculated using a partial lifecycle perspective including production and use phases. A consumption based system definition thus embraces a relational understanding of space and allows for taking responsibility for environmental degradation resulting from consumption also when this takes place in other countries (Steininger et al. 2018; Peters & Hertwich 2008). For energy use, going from a territorial to a consumption based system definition does not imply any major changes because Sweden's import and export of energy (embodied in resources and products) more or less evens out (Energimyndigheten 2016b). However, the GHG emissions intensity of what we export and what we import differs a lot. In 2014, 60 % of the GHG emissions from Swedish consumption happened abroad (Naturvårdsverket 2017c). Moreover, according to the Swedish EPA, the consumption based GHG emissions in 2014 (including public spending) amounted to 104 Mton CO₂(e), i.e. almost twice as much as the territorial emissions (Naturvårdsverket 2017a; Naturvårdsverket 2017b). Out of this, emissions from household consumption (i.e. excluding public spending) amounted to 68 Mton CO₂(e), i.e. 25 % more than territorial emissions (ibid.) (see Figure 4 for a summary and comparison of emissions across system definitions). It should be mentioned that the Swedish statistics on consumption based emissions is an estimate based on trade data and emission intensity standards for the countries from which Sweden import resources and goods. The territorial emissions are calculated bottom-up, i.e. based on data from national inventories, and can be said to be of a higher confidence than the consumption based emissions.

3.2.2 Translating territorial emissions from the energy system to consumption based emissions...

To translate the territorial emissions estimated for Legato to consumption based emissions we assumed that the relation between these two will remain the same in 2050 as in 2014. This essentially implies that Sweden will continue to import more GHG embodied in goods and resources than is emitted within the national boundaries. This in turn builds on the dual assumption that the economy will continue to be substantially global and that if any

decarbonisation of the economy happens it will have the same impact in all regions and sectors. There are basically two problems with this assumption. First, it is not supported by historical data. On the contrary the share of emissions resulting from Swedish consumption but taking place in other countries has increased by 50 % the last twenty years while domestic emissions have decreased by 30 % over the same time (Naturvårdsverket 2017c). This implies that the Swedish consumption is increasingly dependent on ‘outsourced’ emissions. Secondly, looking at the carbon intensity of different sectors and regions, it can be expected that the potential for decarbonisation is greater in parts of the world where ecological modernisation has yet not happened. On the other hand, it could also be expected that Sweden, in the Legato scenario, would take on a leading role in decarbonising its own industry even though opportunities to do so might not be as easy as in other regions.

Today, the Swedish consumption based emissions are 1.7 times higher than the territorial emissions from the Swedish energy system. The consumption based emissions in the 2050 Legato scenario can thus be estimated to be 7 Mton annually, which is still below the limits of the 1.5 degree target, while Vivace 2050 ends up in 15 Mton, which is well above what emissions can be allowed (Figure 3, right bars). We also assume that the relation between public spending and household consumption remains, based on which we can estimate that about one third of Legato’s emissions are coming from public spending and two thirds (circa 4.7 Mton) come from household consumption.

3.2.3 ...to consumption based emissions per capita

We also decided to take future population growth into account. In 2050 the Swedish population is estimated to have increased to 11.3 million people compared to 9.7 million people in 2014 (SCB 2012). If we assume that the 4 Mton GHG emissions from the Swedish energy system in Legato is to be distributed evenly across the population this results in 0.35 ton CO₂(e) per person and year. Translating this to consumption based emissions implies an available carbon footprint of 0.6 ton CO₂(e) per person and year in 2050 (i.e. 0.35 x 1.7), or 0.4 ton if looking at emissions only from household consumption (0.6 x $\frac{2}{3}$).

3.3 Translation 2: Exploring Legato from an everyday life perspective

3.3.1 Finding lifestyles and lifestyle changes

The second step of transforming Legato to a practice-oriented scenario involved scrutinizing the written description of this scenario for all instances where everyday life was described. In the first round of analysis, we focused only on explicitly described practices and lifestyle changes. Two examples of such are that people (in the Legato future) spend more time with their families and friends, and that they invest in photovoltaics. In a second round, and drawing on social practice theories, we also looked for examples of described structural (material or social) changes that more or less directly could lead to changes in practices. One example of this is the description of how the five largest cities in Sweden are to become “car-free”. Changes that we deemed as being invisible to everyday life or having only marginal changes on lived life were excluded. One example of this is automation-based efficiency measures in industry or heating systems, both of which were included in the Legato scenario.

The identified lifestyles and lifestyle changes were synthesised and transformed to a list of calls to action, to emphasise the changes needed according to Legato. The resulting list included thirteen lifestyle changes, each of which comprises one or more practices or practice elements.

1. Increase your self-sufficiency
2. Decrease your working hours
3. Work more locally
4. Telework more
5. Cycle more
6. Choose car pool, rental car and taxi
7. Refrain from longer trips
8. Borrow, share and swap things with others
9. Refrain from environmentally burdening products
10. Prioritise solar, hydro and wind energy
11. Invest in solar cells
12. Spend more time with family and friends
13. Engage in NGOs and hobbies

Two things should be commented on regarding this list. First, life in Legato is clearly as much a matter of changing how to take part in production activities as how and what to consume. Six of the lifestyle changes (no. 1-4 and 10-11) focus on production. Secondly, when comparing this list to Swedish consumption based GHG emission data across consumption categories (Naturvårdsverket 2017b), two of the most important categories – food and housing, standing for 31 % and 21 % of emissions respectively – are more or less completely missing. Returning to Legato we could see that both of these categories are in fact addressed in the scenario, however only through efficiency measures in the food industry and in the housing stock, respectively. Since we thought it would be difficult to represent everyday life futures without addressing food and housing, and since the GHG emissions from these two categories to a large extent fall outside the “Swedish energy system”, we decided to include them in our continued work, even though this would cause somewhat of an inconsistency between Legato as presented by the Swedish Energy Agency and our translation of Legato to an everyday life setting.

3.3.2 Fleshing out practices

To add some more flesh to the bones of the lifestyle list, each suggested lifestyle change was elaborated upon through reference research. This focused on identifying more specific practices related to the lifestyle changes, looking into e.g. what it could mean to “spend more time with family or friends” or what different configurations of “invest in photovoltaics” there are. Here, social practices theories were used as analytical guidance, supporting us to explore and elaborate on what material artefacts (stuff), values (image), know-how (skills) and social relations could come with different practices. The exploration included also practices that might seem more ‘extreme’ (from a Swedish audience point of view). One example where a changed practice is conveyed by a material artefact is Farm 432 by Katharina Unger which is a household-sized insect incubator, aimed at providing easy access to a sustainable and homegrown source of protein. Other examples related to food included e.g. other types of insect production plants, recipes and dishes where insects form the main source of protein, urban farming initiatives (indoors and outdoors, on rooftops and facades, in abandoned buildings or in culverts). One example in which social relations stand in focus is the re-emerging practice of ‘talko’ which, shortly described, is voluntary work carried out by a community for a member of that community, such as harvesting or re-painting a house. Other examples related to social relations included systems and practices related to time banks, local currencies, and ‘sharing economy’ ideas of co-ownership, renting and lending.

To gain a richer understanding of how ‘alternative’ practices could play out in a real-life setting, we decided to interview ‘forerunners’ of sustainable lifestyles’, i.e. people who already have adopted, or partly adopted some of the lifestyle changes found in Legato. The four most challenging lifestyle changes (in relation to the Swedish norm) were chosen for further exploration: *Increase your self-sufficiency*; *Decrease your working hours*; *Refrain from longer trips*; and *Refrain from environmentally burdening products*. These lifestyle changes were chosen based on an ‘extreme case logic’, i.e. assuming that the more difficult a lifestyle change was the more we would learn about both drivers and barriers to making such changes. Respondents were identified through Twitter, Facebook groups and personal contacts. A total of five in-depth interviews were carried out, all semi-structured and all using the same interview guide. The interview guide included questions on how the respondents started to become involved in sustainability issues, how they currently engaged in sustainable practices and their thoughts on future possibilities for more people to become involved. All interviews were recorded, notes were taken, and the interviewer also photographed extensively at the homes of the respondents. The interviews gave insights in practices that currently are seen as foreign but that might be commonplace in the Legato future. For example, the respondents to a high degree referred to other values than what are predominant in Swedish society today, for example spirituality and meditation, working less and emphasising social relationships. Some of them had changed their diets drastically, becoming vegans and even though only one of them was a farmer, many were experimenting with growing their own food. The interviews also made clear how practices are interlinked and bundled as all respondents engaged in more than one of the lifestyle changes we sought to explore, as well as several of the other lifestyle choices on the Legato list. From a social practice perspective this makes perfect sense, particularly when seeing how the respondents’ ‘image’ of themselves and of society created and maintained particular configurations of practices. The photographs provided useful material and visual cues for how everyday life in Legato might look, function and feel. Figure 5 provides one example of this. In the picture one of the respondents is standing next to an area used for cutting logs for the purpose of home heating. This picture shows several of the resources (stuffs and skills) involved in establishing a more self-sufficient way of home heating. The stuff includes machinery, protective clothing, logs, and space needed both to grow trees and cut them to proper pieces. Indeed, it can be debated whether a wood-based home heating system is the most sustainable option. However, the point here is not to provide ‘optimal’ solutions, but to explore what the suggested lifestyle changes in Legato could be in practice, assuming that these would be more sustainable than contemporary alternatives.

Fig. 5. One of the respondents showing part of their home-heating practice, which includes cutting down trees on their property, cutting logs to smaller pieces, and storing and drying these – but also knowing and managing their property well enough to know what trees to cut down and when. The picture is taken in a rural area in the southern part of the Stockholm region, Sweden.

3.3.3 Exploring the built and other environments

To provide a local environment for the people living in Legato we also needed to analyse how the new practices and values influenced the built and other living environments of Legato. Two of the identified production-related lifestyle changes have to do with energy production – of prioritizing renewable energy sources and also to engage in small-scaled energy production (with a focus on photovoltaics). In Legato, energy production in Sweden has undergone quite radical changes: nuclear power, which today stands for about 40 % of power production (2017 numbers) has been completely phased out and replaced by wind and solar power. Wind power production has increased by 450 % from 15,4 TWh in 2016 to 70 TWh in 2050, and solar has increased by 9 300 % from 129 GWh in 2016 to 12 TWh in 2050. Based on rough estimates this would call for about 6 300 added wind power plants², which would demand about 2100 km² of land (or 5040 km shoreline, if placed in one row), and 12.5 million m² (12.5 km²) new photovoltaics³. In line with Legato's ideas of self-sufficiency, the new wind power plants and photovoltaics can be assumed to be located in close proximity to where people live, or, in the case of wind power, as close as is permitted.

A study by Kamp (2013) estimated that about one third (319 km²) of the total rooftop area in Sweden (1 091 km²) are available and suitable for photovoltaics. Thus, to achieve the levels

² The estimates are based on that the new wind power plants will be equivalent to the average wind power plant built in 2015, which had an installed effect of 3200 kW and produced on an average 8,7 GWh per year. This is an admittedly low estimate and the total numbers of added wind power plants needed could thus be assumed to be lower. However, as the Legato scenario emphasises increased self-sufficiency, and since a large share of Sweden's population is expected to continue to live in cities, it can be assumed that an increasing share of the total wind power stock will be smaller in scale than today's average, and thus produce less energy.

³ This is based on the assumption that 5 m² photovoltaics will provide 950 kWh per year. This is based on the assumption that photovoltaics will have an efficiency of 20 %, that the ratio between production and installed effect is 950 kWh/kW, and that all the added photovoltaics are optimally placed.

of solar power production in Legato, it would suffice if an average of 20 % of all rooftops were covered by photovoltaics, providing good possibilities for optimum placing. The new photovoltaics can also be put in relation to population, in which case there will be an additional one square meter photovoltaics per person (2050 population). This is a relevant comparison as it points to that there will either be a need of some kind of energy communities formed between people living in single family houses (large rooftop area per person) and people in multifamily houses (small rooftop area per person), or people living in multifamily houses will either need to add photovoltaics to the facades, which is fully doable, or find space elsewhere. Speculating about the location of wind power in the same way is harder due to regulations regarding how close to residential housing different kinds of plants can be built, but it can be assumed that wind power plants will become a more common part of urban and peri-urban environments alike, as it would, according to the logics of Legato, be situated close to where people live, i.e. in the southern parts of Sweden.

Another production-related practice that seemed to have a potentially large impact of the material and spatial make-up of Legato was the increased self-sufficiency. Here we chose to focus on food, apart from energy. The reason for not including other consumption categories, such as housing (timber, concrete, glass, plastics or copper for plumbing etc.) or transports (steel or aluminium, rubber etc.), was that we thought it would be too cognitively (and perhaps emotionally) challenging being presented with a future where everything had to be produced by households or in communities. Producing food demands a lot of space, and in contemporary Swedish cities, space is a rare and expensive asset. However, since the Legato scenario posits that the five largest cities of Sweden have become free from private cars, there should be a lot of space freed up which could be used for food production. While this space would not provide food to more than a few percent of the inhabitants, it would substantially alter the look and feel (and sound and smell!) of the cityscape.

3.3.4 Provocation

Based on the reference research, the interviews with ‘forerunners’, and the exploration of the built and other environments, the key practices identified in Legato were prototyped into more concrete configurations and (related) socio-material and spatial contexts. Keeping the interrelatedness of practices in mind we allowed practices to be combined whenever it made sense, for example increased self-sufficiency and spend more time with family and friends, or work less and invest in solar cells. These practices and the Legato future at large were then further explored in a ‘provocation’ workshop. The aim of the workshop was to provide further input and insights to the process of re-presenting Legato. We were particularly interested in exploring what participants perceived as the ‘lost and found’ of a low-carbon future, but also to explore if our draft building blocks for the transformation of the Legato scenario ‘made sense’ to the participants, and what type of engagement it created. To this end, we used the material developed so far to design four different trigger materials: 1) the use of a carbon calculator and comparison of the personal footprint to the footprint suggested by Legato to be sustainable (0.6 tons per person and year); 2) an image sorting exercise in order to explore lost and found in the future; 3) fictitious headline posters describing possible ways the Legato future could play out; and 4) “fill-in-the-blanks” posters. The design of the workshop, the trigger material and the outcome of the workshop are extensively presented in Anonymized. (2018), but a few highlights will be provided here. First, it was clear that several of the workshop participants had expected their personal carbon footprint to be smaller, something that seemed to cause feelings of discomfort, disappointment and frustration, especially when their footprints were compared to the 0.6 tons target. Second, the image sorting exercise and the headline exercise revealed that for many of the participants, not being able to travel by

airplane (as much as currently) was the main loss, and that even the suggestion of a halt to flying in the future, was by some seen as preposterous. At the same time, it was not hard for people to find possible positive consequences of the transitions presented in the trigger materials. The most common ‘found’ revolved around immaterial values, replacing consumption by experiences and spending time with family and friends. Several participants also saw possibilities for living more healthy lives, with less pollutants and stress. The third insight presented here dealt with the question of how a transition could happen, where several participants expressed wishes for more regulations of production and consumption, as long as it created equal opportunities for everyone. This is very much in line with findings from the Swedish ‘climate barometer’ indicating a strong support for substantially increased political action on climate change (WWF & SIFO Kantar 2018). We could also conclude that the draft building blocks for the transformed Legato scenario ‘worked’ in that they created engaged discussions and personal reflections. The participants connected the suggested practices and related socio-material structures to their own everyday life, and started negotiating with other participants, us researchers – or themselves – on why or why not a specific idea was conceived of as probable, possible and/or preferable.

3.4 Translation 3: Re-presenting Legato

There are many different ways of representing scenarios. Scenarios can be described in text (using one or more writing styles, e.g. ‘objective’ description, fictional interviews or diaries, poetry...), in fictional statistics (presented as numbers, tables, diagrams and/or infographics), images (photographs, photomontage, illustrations, maps), prototypes (more or less working, in more or less accurate scale, in a variety of materials produced by a variety of techniques), or through games, literature (short stories, novels, poetry), movies, theatre plays, art installations, live action roleplay games, etc. The selection of what combination of representation techniques to use in a specific project can be made on the basis of what one believes will be beneficial for an intended target audience, on the basis of the nature of the questions explored in the scenario, on the basis of epistemological understandings or ambitions, or to gain more knowledge on how to use one or more techniques. As described in more detail below, the new re-presentation of Legato could be said to be a combination of the mentioned techniques, paraphrasing the form of an historical manifesto.

When discussing different possible ways of representing Legato, the project team made connections to the Swedish modernist manifesto ‘*acceptera*’ (an English translation is available in Creagh et al. 2008). This manifesto was published in 1931 in relation to the Stockholm exhibition, and both the exhibition and the manifesto are generally recognised as having played a fundamental role to the breakthrough and wide adoption of modernism and functionalism in Swedish society (Mattson & Wallenstein 2010; Rudberg 1999). The ‘*acceptera*’ manifesto was authored by the director for the Swedish crafts association [Svenska Slöjdföreningen] together with five architects and had one main aim: to argue for a full surrender to (acceptance of) modernism, functionalism and industrial production. The manifesto is organised in twelve sections, of which the first three are introducing and framing the challenge, as the authors perceived it, and the rest includes detailed descriptions of how everyday life in the future modern “A-Europe” (sic!) should look like. This future is represented by a combination of text and visual elements, including photomontages, photographs, maps, illustrations, tables and diagrams. ‘*acceptera*’ is written in an unabashed and demanding tone of voice by which we were particularly intrigued. Besides providing inspiration for how the re-presentation of Legato could be shaped, we used ‘*acceptera*’ as point of departure to connect Legato and contemporary calls for sustainability transitions to a

historical era of transformation. Connecting to ‘*acceptera*’ would also (or so we hoped) work as a leverage point when communicating our project.

Initially we planned to stay as close to ‘*acceptera*’ as possible, using the ‘minimum rewrite rule’ (e.g. Gilbert & Lambert 2010) to create more or less a paraphrase of ‘*acceptera*’. However, since ‘*acceptera*’ mainly focuses on urban planning, architecture, and interior design and decoration, there were too much in Legato that would have had to be left behind for such an approach to be possible. However, to keep the connection to ‘*acceptera*’ we decided that part of the Legato representation should be a manifesto and written in the same urgent tone of voice, and that the visual material should, whenever possible, draw inspiration from the visual material in ‘*acceptera*’. We decided to divide our representation into thematic sections, similar to ‘*acceptera*’, and at a later stage we chose to include images from ‘*acceptera*’, as a sort of visual reference.

3.4.1 Content and structure

To create the thematic sections, the list of practices from Legato was boiled down to four categories: Housing, Transports, Food, and Work and leisure time. The two practices related to changed social relations (Spend more time with family and friends, and Engage in NGOs and hobbies) were decided to be integrated in the other categories of practices instead of forming one or two additional categories. The reason for this was the realisation that social relations and societal values would be quite hard to depict if not connected to and narrated through the perspective of the other practices. As in ‘*acceptera*’, we also included an introductory section, setting the scene for the rest of the sections. To emphasise the collective values of Legato and the practice-focus we decided to name the five sections with an active verb denoting the practice(s) in focus and a collective subject (we). Eventually the sections were named *We make the transition*, *We live*, *We travel*, *We eat*, *We work and have leisure time*, respectively.

Each of the five sections includes one part with a text-based manifesto and one part with an image-based future archaeology. In relation to the manifesto it was also decided to include annotations, to provide references for or expand on assertions made in this. Each section is concluded with pictures from ‘*acceptera*’ and a poster, the latter of which could be teared loose. The structure of ‘*Vitiden*’ was made with the ambition of the text as a fictional reading experience first and foremost. Just as ‘*acceptera*’ in the 1930’s, ‘*Vitiden*’ should mark the progression of a new era with a strong statement and vision of future life. To avoid spoiling the experience of the design speculation, the methodological framing and aim of ‘*Vitiden*’ were placed last, together with a table of content and lists of authors and references.

3.4.2 Manifesto and future archaeology

A manifesto is a normative and future-oriented statement. A manifesto does however rarely describe the future directly, but indirectly. Since we did not only want to represent Legato’s ambition but also show how Legato might play out, we complemented the manifesto with a representation of this. Thus, we decided to add a ‘future archaeology’, represented by different types of illustrations. Through having two representations of Legato, speaking from different temporal positions and through different voices, it became easier to avoid the homogenous character of many target-fulfilling scenarios and instead provide more diverse, ambiguous and gritty representations of Legato, where some ambitions of the manifesto have been fulfilled and others sanded down.

To further support diversity it was decided that illustrations comprising the future archaeology should preferably be developed by more than one illustrator, and that they should represent different types of artefacts, situations, bodies and practices. However, due to project limitations, in the end only one illustrator was contracted. The style of illustrations as well as other visual material was, after some internal debate, chosen to be relatively non-specific and open to interpretation in order to invite readers to fill in the gaps and imagine the details on their own. As a support to the illustrator several iterative phases of ideation in the research group provided input on what to illustrate (Figure 6).

Fig. 6. Some outcomes from one of the ideation sessions in which development of the future archaeology was in focus. From top left the ideas are: a pizza menu; a guide to upcycling garments; a photomontage of buildings with lots of solar cells and panels; a consumer test of energy management apps; a car which is abandoned because its owner does not have the proper environmental permit; an electric and self-driving car with a stressed out AI; and an ad for a volunteering scheme in which you earn 'carma credits'. Of these ideas only the pizza menu and, to some extent, the solar panels made it to the final representation.

The manifesto, however, was given one single voice, that of Legato. The manifesto was written based on the idea to make explicit the ethics of Legato (ecological sustainability and global solidarity) in relation to the five thematic sections. The writing process was guided by asking ourselves what Legato would say, should it materialize as a person, and get on a soapbox to deliver (itself in form of) a speech.

3.4.3 Graphic design and production

The project team included two graphic designers who, thanks to their early involvement contributed not only to the graphic and book design, but to the entire structure and content of the Legato representation. The form of the book was developed as a design speculation in its

own right, exploring how graphic design, choice of materials and overall form would look like in Legato; i.e. how could the ethics of Legato be represented also through the design of the book. To this end the “*Recently Discovered Tips for Ecological Graphic Design*” by Sara De Bondt and Chris Svensson (2009) was used as point of departure. This includes suggestions regarding choice of paper, ink and binding, size of paper and number of colours etc. Design choices, such as what paper to use, including its number and size, the number and types of inks, the binding technique and material, as well as the size of the print edition, were all taken with an aim to make as small environmental footprint as possible.

3.4.4 Naming the publication

One of the last pieces to fall into place, and one of the questions causing the most heated discussions in the research team, was the name of the publication, i.e. ‘*Vitiden*’, which is Swedish and can be translated to the ‘we-age’. In contrast to other ‘ages’ such as the bronze age or the atom age, ‘*Vitiden*’ is not a description of a historical era, but a suggested future, an age yet to come, distinguished by its emphasis on togetherness. The name ‘*Vitiden*’ thus have a clear connection to the name of its origin, the scenario Legato, with legato meaning ‘tied together’.

4. Results

4.1 The design speculation ‘Vitiden’

The resulting design speculation, or ‘energy fiction’ as it is called in its subtitle, is a 24 x 17.5 cm book of 128 pages. The format of the book follows a standard that minimize paper waste in the cutting process. The paper is eco-labelled and based on 100% recycled fibre. A spiral binding facilitates further recycling, once the book is headed that way. Only two colours are used in the book block (pink and brown) and fonts, illustrations and graphic elements (such as the legato arcs connecting the manifesto with references, see Figure 7) were designed and selected to make use of as little ink as possible per page. The book is printed in an edition of 400 which was assessed as being sufficient for reaching the dissemination target of the project. The cover of the book (Figure 8) presents the title and an illustration of a tree in small-sized metallic print. The cover is otherwise dominated by circles and rectangles cut as an abstract pattern, which in fact are the building blocks for the font used in headings in the publication (Figure 8). The idea behind punching the shapes, instead of printing them, was partly to save ink, but also to allow for the front to be used as a template, should anyone want to make posters of their own. This font was developed to save ink, but is also in a way a representation of *Vitiden* as it can also be read as a network of connected nodes.

Fig. 7. The front page of Vitiden. The pink shapes are the cutouts.

Fig. 8. An example of a heading in *Vitiden* (*Vi arbetar & har fritid* [eng. *We work and have leisure time*]).

Throughout the book, the manifesto is printed on the right side of each spread (Figure 9). On the left side there are annotations and references. The references are connected to the manifesto through legato arcs. The annotations are set in a different typeface and include e.g. citations from scientific texts, quotations from the provocation workshop or interviews with forerunners, poetry and lyrics, or statements, but are always in conversation with the manifesto.

Fig. 9. An example of a spread from the manifesto. Here, the short annotations on the top of the left side are quotations from focus groups. The top one reads “Is it really meant that one is not allowed to have any icing on the cake in your life? Is it meant that this should be denied? Is it meant that one should not be allowed to do one’s road trip? We are humans, we have to be allowed to do fun stuff.”

The future archaeology is represented in a rather stylised manner and comprise altogether thirteen illustrations, most of which span entire spreads. Some of the illustrations are produced by the illustrator and others by the graphic designers. We have selected four illustrations to present here, one per thematic category (Figures 10-13).

Fig. 10. In a future in which a larger share of energy will come from the intermittent energy sources wind and solar, paying attention to power production forecasts will be increasingly important.

Fig. 11. Private cars are gone. One of the large bridges in Stockholm has been transformed to a bike and pedestrian bridge. Illustration by Laurie Rollitt.

Fig. 12. On the left side is a pizza menu, organised in three sections: one vegetarian, one ento (i.e. insects), and one meat. The vegetarian section includes e.g. the pizza “One season” (or ‘una stagione’) which comes in four varieties (one per season) and “Last year” which includes pickled tomatoes and dried chanterelles. The ento section includes one pizza with brimstone larvae and one with witjuti grubs. The meat section is considerably more expensive and includes two pizzas with different types of preserved meat, one with spam and one with salami. On the right side is an excerpt from acceptera, which was there used to portray ‘A-Europe’. We know today that the large scale industrial agriculture are not a sustainable form of food production.

Fig. 13. Diary. "I don't attend day care now because mum and dad are at home. We get to join them at the farm every day. They are much happier now. Better than when they work during the winter. I'm going to get my own pumpkin seedlings. Tomorrow we are moving them outdoors."

The entire publication can be downloaded from [information not included to maintain anonymity]. Since *Vitiden* was launched in December 2017 it has been downloaded more than 900 times. Several people have also been in touch to order physical copies of the book, for example to be used in a study circle in a small village at the Swedish countryside and by one of the Swedish County Administrative Boards [*länsstyrelse*] who were interested in exploring the possibilities of using speculative design for the sustainable development of the county.

4.2 An approach to translate policy-orienting scenarios to practice-oriented design speculations

As reported in the previous section, the process of translating Legato from a policy-orienting to a practice-oriented design speculation involved a number of different approaches and methods, including systems analysis, discourse analysis, reference research, qualitative interviews, visual ethnography, focus groups with trigger material, creative writing, graphic design, and illustration. This process was developed iteratively throughout the project, and involved numerous trials and errors, cul-de-sacs and occasional breakthroughs. What is presented in Section 3 is a simplified version, focusing mainly on presenting the activities and methods that worked, in the sense of moving the translation of Legato forward.

In this section we present an even more simplified version of the process, formulated from the perspective of acknowledging the process as part of the results. In essence, we believe that the process of transforming a policy-orienting scenario to a practice-oriented design speculation can be boiled down to three main acts of translation:

1. Setting the scope of the transitions
2. Exploring practices and contexts
3. Re-presenting the future

It is essential to understand that, for this project, the transformation process comprised two interlinked translations: one ‘content’-focused translation of the policy-orienting scenario of Legato to a practice-oriented scenario, and one ‘form’-focused translation of the report to a design speculation. We believe it to be perfectly doable to engage in only one of these translations, however with consequences for the end-result. Only doing a translation of policy to practices without reworking the (re)presentation of the future would risk losing the opportunity to engage also other audiences (than the ones reading reports), as well to engage audiences in other ways (emotionally, bodily) than reports typically do. Only doing a translation of the form of the policy-orienting scenario could increase accessibility and engagement, but probably only to a limited extent given the abstract level of such scenarios. It is also possible to skip the first step, the analysis of the scope of the transition, and go directly to start exploring practices and contexts, however at the risk of not knowing to what extent the suggested proto-practices are sustainable (enough) to support the realisation of the policy-orienting scenario.

4.2.1 Understanding the scope of the transition

Understanding the scope of the transition is about analysing what the policy-orienting scenario implies in terms of limits to consumption and production. How many tons of CO₂, how many kWh, or how many kilograms of resources will be available per person in a sustainable future? Depending on the character of the policy-orienting scenario and the aim of the translation, this analysis might be more or less complex and time-demanding. Key methods for this step are systems analysis, to understand system definitions and implications of these, and basic calculations, to translate different type of data from one system definition to another or from one unit to another (e.g. going from kWh/m² and year to kWh/person and year). One relevant limitation to consider is data availability. In Sweden there is a long tradition of national and local authorities generating and publishing data and statistics, which often are openly available online or is but an email away.

4.2.2 Exploring practices and contexts

Exploring practices and contexts is about analysing what traces of, or cues for, different practices there are in the policy-orienting scenario, as well as fleshing these out to proto-practices. Key methods for this step include document analysis of the policy-orienting scenario to identify possible practices, as well as reference research, different types of contextual interviews and observational studies, and creative and evaluative workshops to turn these into situated proto-practices. To gain as rich and situated information on practices as possible, interviews that involve diaries, cultural probes or visual cues are recommended. The exploration of proto-practices can be made more or less participatory, and more or less design-driven. One strategic decision to make in this step is to decide how ‘radical’ the proto-practices should be. If using a participatory approach this can be left to the participants to decide or provide guidance on, but if not, it is advised to test the proto-practices on a group of people who are not ‘forerunners’ themselves to see how they react to the proto-practices to allow for a calibration of the material. Another important consideration is *whose* practices to represent and transform. Here categories of gender and gender expression, age, ethnicity, sexual orientation, ability, class, income, and place of residence are useful to consider to ensure that the future does not end up being told through the eyes of corporate or policy

personas, such as Resource Man (Strengers 2014), or becomes another example of speculation from places of privilege (Prado de O. Martins 2014).

4.2.3 Re-presenting the future

Re-presenting the future is about giving form to a scenario, a process that involves a large number of different design decisions, some intentional and some bound to be unintentional. Giving shape to a scenario includes selecting medium, materials, form and aesthetics, each which typically involve numerous further choices to be made (see Knutz et al. (2013) for a useful overview). The choices made on this level of articulation are essential to allow for reactions and critique to be rooted in everyday life experiences. In some cases, such as if one wants to make an exhibition, the choice of place is also relevant. No universal recommendation can be made here as each type of media, materials, aesthetics and voice come with benefits and drawbacks. If it has not been done before this is the time to think about target groups, i.e. who do you want to engage by/in this future, and let this guide the design decisions. Thinking through benefits and drawback of different media etc. across key stakeholder groups in a structured way can provide useful insights in a relatively easy way. If a design-driven process has been used to elaborate on proto-practices it is easy to continue using the same materials and aesthetics that were used in Step 2, however what worked well to prototype (parts of) a scenario might not be what works best to communicate it. The representation, including its design, can also deliberately balance provocative and affirmative design choices when aiming to engage, as further explained in Anonymized et al. (2018).

5. Concluding discussion

Vitiden is very much a result of the people involved in the process, including their experiences and aspirations. Another group of people would most likely have translated Legato differently, seeing or emphasising other proto-practices, and made other design decision. This is however the case of all scenarios, no matter if they are policy-orienting, design-orienting, or practice-oriented, or the form they are represented through. One aspect of *Vitiden* that did not turn out as intended was the illustrations representing the future archaeology. Initially we had intended both for a larger number and more diverse styles of illustrations, bringing in a diversity of voices through different aesthetics. However, due to limitations in the project (including both funding and time) we had to settle for one illustrator only. In addition to this, it turned out that our idea of leaving space for ‘artistic freedom’ in translating the proto-practices to illustrations did not match well with the illustrator’s need for direction. The lesson learned from this experience for future projects, is to set aside a larger budget for artists, allocate more time to select artists, and to engage artists early on in the project. Another lesson learned is to plan for more prototyping iterations in the project.

Regarding the structure of the book and its backwards disposition, which was intended to afford the reader to explore the design speculation ‘freely’, we learned that this could instead cause confusions, judging by some of the comments heard during the book release. On the one hand, *Vitiden* was not made with the intention to present the research projects as such (as this article is) and the ambiguity of the form should be seen in the light of its role as a research probe. On the other hand, *Vitiden* was made with the ambition of making the future more present and accessible to a wider audience, and thus, if the structure hinders people from engaging with the material in the book, in the future we would need to consider whether a more conventional structure might be better.

The process of transforming Legato to a practice-oriented design speculation was an experiment right from start. When the project started, in which Vitiden eventually was developed, we did not know that we would make and print a book. Vitiden is thus at the same time a result and an intervention, and is a scenario narrative as much as a designed material artefact. Vitiden is a re-formulation of a possible future. As such it allows for engagement, interpretation, reflection (and opposition) on different levels and from different perspectives.

The experience of developing Vitiden has resulted in a three-step process for translating policy-orienting scenarios to practice-oriented design speculations. As an intervention, Vitiden has just started its journey, and there has so far not been any structured evaluations of how people perceive of this artefact. Is it comprehensible? Does it succeed in making the future more present? Does it succeed in spurring reflections, and if so, of what sort? Does it induce change in people to make more sustainable lifestyle choices and engage in more sustainable practices? At the book release, postcards were handed out with the request for feedback, but only one postcard and one handwritten letter has so far been returned. One lesson learned from this could be to plan an infrastructure for feedback and/or reflection that is more situated and curated than being handed a postcard to be returned at a later stage. However, based on the large number of downloads (more than 900 in 15 months) and requests for printed copies it seems that there is an interest to engage with the future in a more hands-on way than traditional abstracted scenarios allow for, alternatively that there is an interest in this way of doing futures studies.

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