Nature in Your Face: framing co-creative visioning

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Abstract

More and more experts are explicitly talking about the need to limit consumption, on both an individual and a societal level. It is time for a shift away from the current path of nudging us into new consumption patterns without it requiring major changes in our way of life. Eco visualization, or eco-feedback, has proven useful in helping individuals to act in accordance with their (pro-) environmental values/identities. The project Nature in Your Face (NiYF) develops a versatile methodology for participation designed to help us take a leap forward and mobilize communities and resources in solving pressing issues. NiYF uses eco-visualizations to reconnect humans with the eco-system. At the core of the methodology lies the idea of challenging our current way of doing things by confronting us with nature, or representations thereof, accentuating our dependence on it. By using art inspired, technology supported eco-visualizations that wilfully put us out of our comfort zone, we stimulate creativity, debate and engagement. In order to not only create discomfort and question the current status quo, this confrontative approach is part of a structured three step process that is designed to harvest engagement, and open up for innovation and creativity, and finding new ways of doing things.

This paper describes the first NiYF case, Kristiansund, where the methodology has been used in a Climate-KIC funded ideator-project to support an ambition of plastic-neutrality. The methodology consists of three interdependent pillars to develop the future city together: 1) Framing, 2) Twisting, and 3) Using. The first pillar involves a confrontation or challenge addressing the problem to be solved. In Kristiansund, this challenge was "the growing amount of plastic in the ocean", while thematically framing it to specific practices or contexts. The second pillar opens up for co-creative visioning in which alternative ways of doing things are developed. In Kristiansund, this was kick-started by presenting potential radical changes in local conditions, such as local plastic-bans (twisting) in each of these practices and contexts. The final pillar involves testing these ideas and concepts in practice (using). Using Kristiansund as test case, this paper demonstrates how the NiYF methodology offers a framework for helping communities to mobilize resources, unlock innovation potential and support cooperation between municipalities, citizens and (local) businesses in solving pressing issues in their community. The case has been used to fine-tune the methodology and to establish a proof of concept of the NiYF methodology. It provides a new approach to meet the challenges of creating a future (city) that invites citizens to experiment, explore and debate together with municipalities, universities and businesses.

Introduction

Municipalities are the custodians of vast public resources that, when managed properly, are instrumental in the development of cities that are happy, healthy and regenerative and the societal impact of these resources might depend on the quality of participation of and interaction with stakeholders. To facilitate such participation processes, the project described in this paper delivers a new methodology, referred to as "Nature in Your Face" (NiYF), which is specifically aimed at working together across stakeholder groups to create solutions delivering shared value. It is built on the assumption that reciprocity among citizens is key to capturing the hearts and imaginations of all those who are part of the solution. At the core of the methodology lies a shift in mindset: away from the prevailing emphasis on not disrupting lifestyles, increasing comfort and making change as easy as possible (e.g., as proposed in the nudging concept) towards disruption and active work for radical changes.1 We believe that such a reorientation not only elicits participation but may even multiply the resources available to get the work done together as it also stimulates group processes and a feeling of belonging to a social group working towards a common goal as indicated by research on social identity and environmental action (Fritsche, Barth, Jugert, Masson, & Reese, 2017). Hence, a methodology that helps us take a leap forward and mobilize communities and resources in solving pressing issues may not only make sense as a tool for a limited application in a project case, but results may become part of the knowledge base that contributes to new ways of coping with barriers towards regenerative cities and this way of decision making might "infect" further sections of society. It may also increase acceptability for new and perhaps challenging policies as they in the ideal case emerge from within society and are not enforced from small and powerful interest groups. Based on these considerations, we investigate NiYF as a potential way of turning the tables by supporting municipalities in involving citizens, start-ups, innovators, businesses and organizations to become drivers of this development by demanding policy changes rather than simply adhering to ready-made, top-down solutions.

Though being new in many respects, the NIYF project is building on the theoretical work of researchers from several disciplines. The level of change aimed for by the NIYF methodology can be described in the terminology of a societal transformation. Feola (2015) describes in a review paper several concepts of societal transformations driven by global environmental change, where especially the concept of deliberate transformation (O'Brien, 2012) and regime shift (Folke et al., 2010) are relevant for our context. O'Brien (2012) outlines that a deliberate transformation is "a psycho-social process involving the unleashing of human potential to commit, care, and effect change for a better life" (page 4), which is in line with what NIYF is conceptualizing. Folke et al. (2010) distinguish between active transformation, which is a lower scale reconceptualization of some elements of a societal system while keeping the resilience of the overall system, from forced transformation, which is an imposed transformation not deliberately triggered by the actors in the system. NIYF tries to link these two elements: Triggering a forced transformation by stimulating a society with "unwanted" impulses, whereas then channeling that process over to an active transformation carried by the actors within the system.

On the more psychological level, NIYF builds on elements of social influence and group processes: Cialdini (2003) identifies social norms, social learning and social comparison as key elements for adoption of new ideas, which makes the aspect of social interaction an important component of the NIYF methodology. This is further supported by Abrahamse and Steg (2013) who found that social influence processes should involve direct social interaction to be successful. Transferred back to policy making, this implies that participation and autonomy should be strengthened, and be sustained over time (Bomberg & Mc Ewen, 2012).

A third theoretical pillar behind the NIYF concept can be found in social practice theory (Shove, Pantzar, & Watson, 2012). This theoretical branch assumes that peoples' behavioral practices are rooted in a complex interaction of physical structures, regulations, and attached meanings. For NIYF, this means that the approach should challenge all three components to successfully change practices. Kalkbrenner & Roosen (2016) found that community projects may foster new norms, which might then change the meaning component of the social practices. Building on all three theoretical pillars, NiYF provides a strategy for co-creating and maintaining sustainable practices with policymakers and stakeholders by challenging assumptions and meanings, structures, and regulations through a social process which unlocks creative potential and societal resources, and triggeres a societal transformation, if successful.

TRANSFORMING IN WHICH DIRECTION?

What has been stated so far raises the question, what kind of societal transformation NIYF would aim for. In the urgent need to address global climate change, scholars in the field have increasingly acknowledged the necessity to challenge the mantra of constant economic growth and rather limiting consumption (Ahuvia, 2017). Often consumption of goods is assumed to contribute to people's happiness and life satisfaction. However, compared to other daily activities, shopping in general scores only in the middle in terms of being an enjoyable experience (Zuzanek & Zuzanek, 2014). The most enjoyable activities are active sports, socializing and sex (Csikszentimihalyi & Hunter, 2003; Zuzanek & Zuzanek, 2014; Ahuvia, 2017). Furthermore, experiences with nature have often been found to contribute to well-being (Russell et al., 2013). Interestingly, all of these activities do not per se involve consumption, and interpersonal relationships has been found to be central for individuals' enjoyment of these activities (Ahuvia, 2015). The NIYF methodology as a social activity could therefore in itself contribute to substitute consumption based with social activity based happiness.

CONFRONTING HUMANS WITH NATURE?

As stated in the previous paragraph, nature experiences are usually perceived as contributing to peoples' well-being and happiness. However, in NIYF we conceptualize nature (also) in a different function, namely to create attention by disrupting establised ways of being or seeing. NIYF utilizes eco-visualisations to achieve awareness, flexibility and of spurring debate (Löfström & Svanæs, 2017). The eco-visualizations used in this project are not to provide neutral feedback, but designed to wilfully put people out of their comfort-zone by presenting nature or consequences of our societal use of resources in ways that are somehow disturbing. By using emotional stimuli in communicating we increase the possibility of people reacting to these concepts. However, this reaction is direct and - at the same time - transient. This means that if we present provocative eco-visualizations to members of the community, we invite them to react - and act upon these reactions by communicating

The authors acknowledge that also nudging approaches are meaningful under some conditions, but that they inherently stabilize the overall status quo and might not achieve the level of change needed.

their feelings or thoughts. However, in opening up difficult and disturbing themes and problems, we need a plan for harvesting these reactions. Hence, even though illustrating pressing issues, such as climate change, may well be useful as isolated events or installations to boost reflection and debate (Miles, 2010), NIYF harvests these reactions and carries them further in a social process.

The methodology uses provocative eco-visualizations because provocation lead to emotions, and emotions are more likely to lead to direct engagement than just information (Klöckner, 2015). Furthermore, once these emotions have been translated into engagement, this can be used as an entrance point for broader and/or deeper engagement. However, the emotional response to eco-visualizations typically do not last very long due to the process of getting familiarized with it, which counteracts its effects (see Löfström, 2008). This means that time is of the essence, and thus, we need to make use of the momentum and spontaneous reactions that come from the emotional stimuli (Klöckner, 2015). Ideally, the invitation and methodology that allows for people to discuss and engage in solving the issues raised should be presented in direct connection to the visualization itself. We open up a window of opportunity and need to start the process of harvesting this engagement.

THREE METHODOLOGICAL PILLARS

First, as the methodology is to support municipalities' ambitions to solve pressing issues in the community, it is necessary to define the overarching visions and goals together with the municipalities in question. This is done by the main researcher in cooperation with key competences in the municipality organization(s). The eco-visualizations should be developed to actualize this vision or goal in a confrontative or challenging way.

One of the problems with addressing extensive challenges, such as the growing amount of plastic in the ocean, is that the problem is so multi-faceted and complex. It becomes too large and the willingness to engage is largely dependent on both the perceived meaningfulness of peoples' own engagement – i.e. the perceived ability to contribute anything meaningful to the discussion – and the perceived potential influence of this contribution to the discussion (Fritsche et al., 2017). Thus, limiting the scope of the challenge thematically or contextually helps overcome the "empty canvas syndrome", i.e. the fact that total freedom may indeed be demotivating (Rosso, 2014). Asking people to go create without specifying the potential level of influence and the expectations on their part of such creative processes, will most likely lead to insecurity and unwillingness to contribute. Therefore, the first of the three pillars, framing,

has the main intent of limiting the problem into something manageable.

Once we have framed the problem area to make it manageable, it is time for the next pillar, "twisting". Again, giving people limitations or pre-defined themes to work with does not limit imagination. On the contrary, it helps open up for imagining a possible world; a temporary space, within which one can explore any set of ideas or possibilities (Gray et al, 2010; Dunne & Raby, 2013). This twisting state builds on specific challenges or scenarios that are set in relation to the previously framed contexts or themes. The intent of twisting is to get the participants into a creative and visionary mode. This is done by presenting goals that are more challenging than usual or by presenting truly ambitious or near impossible challenges.

Both the "framing" and "twisting" pillar may vary with the type and role of the participants. In Kristiansund, we tested the methodology in two sets of vision workshops. First, we arranged two separate workshops with local businesses and municipality employees. Secondly, we arranged two workshops at a local school with children in fifth grade. For this workshop, school children were chosen both to test the methodology in different settings, but also to get a different perspective from the more established "grown up" prespective. Both sets of workshops were led by the researcher, with the assistance of municipality employees.

The third, and last, pillar is "Using". Using in this context means that the knowledge, ideas and solutions that have been developed as part of the previous two phases are used or taken forward either into actual decisions or are somehow included in the process of achieving the set goals of the municipality. The key issue here is not necessarily to implement all solutions, but to acknowledge the importance of these ideas and discussions and consider and/or elaborate on them. Communicating this influence is necessary to motivate participation (Støa, et al., 2014 Eds) and to demonstrate that this is done ensures the transition from a one-off reaction to the eco-vizualisation to continued willingness of participation and of contributing to achieving the set goals.

Results of a case study on plastic waste

In the case study, the researcher and problem owner (Kristiansund municipality) met at the Nordic Ideation Day arranged by Climate-KIC (https://www.climate-kic.org/events/nordicideation-day/). Here, Kristiansund municipality presented the problem of large amounts of plastic waste being brought ashore and the researcher suggested testing out the NIYF approach and methodology to support them in tackling this issue. The defined problem was then elaborated upon with regards to the

Framing

Confrontative eco-visualization(s) addressing the "problem", which is then framed to specific practices or contexts

Twisting

Presenting potential radical changes in local conditions for the framed practice or context

Using

Involves testing these ideas and concepts in practice & follow up

Figure 1. The three methodological pillars/phases.



Figure 2. Photo from outside the local plastic recycle plant. In the background you can see the mountains. The plant is located just by the shoreline by an old industrial harbor. (Photo: Erica Löfström.)

potential use of the NiYF methodology. The discussions that followed led to an idea for a project that was presented to a jury by the researcher as part of this ideation day. The researcher managed to convince the jury of the project potential and won an award together with a promise of funding (15,000 Euro) for a three-month project. When the project goal was developed, the municipality already had an ambition of dealing with the large amount of plastic that floats ashore on their (long) shorelines. They also had local companies that were well underway to build a local plastic recycling plant. Even though it is still a major challenge to aim for plastic neutrality in Kristiansund, the large amount of plastic waste brought ashore by the Gulf stream and the fact that a local business is building a stateof-the-art plastic recycling plant was discussed in the project group. In this case, the confrontative eco-visualization was not difficult to achieve as nature is already doing it; the plastic waste is already very visible in the community and the contrast between Kristiansunds' picturesque shoreline and the plastic is in itself already striking, We therefore showed pictures of huge piles of gathered local plastic waste to the workshop participants (see Figure 2) with examples of plastic waste art installations in the workshops. We also referred to previous headlines regarding this in the local press. For the case study, we did not create specific eco-visualizations and utilized the fact that plastic waste is in itself confrontative and alarming. To illustrate the reactions, plastic was referred to as "nature's vomit" by both the children and the adults that participated in the workshops.

FRAMING FOR GROWN-UPS AND FOR CHILDREN: "NATURE'S VOMIT"

We arranged two vision workshops with adults (Table 1), each with slightly different participant groups². In both workshops, the participants were divided into groups of 3–5 people. Due to differences in the participant groups, the two workshops had a slightly different focus that was communicated in the invita-

tion together with the vision workshop topic "plastic neutrality for Kristiansund - how to make it happen?", the first one was focusing on visions and the participants included representatives from a local school while the second workshops focused more on technology as the participants were of a more technical business focus. The first vision workshop had six participants and the second had 12 in addition to the project group. The participants were recruited by the Municipality project group members via emails, which was complemented by additional phone calls. The size of the workshop groups was not identical as recruitment is dependent on who is able and willing to participate, but our intention was to have between 5-12 participants in each group to ensure a beneficial number of people for having fruitful communication (Kitzinger, 1994). The second group ended up being slightly bigger than initially planned with a total of 12 participants (plus researchers and facilitators), but the participants were later divided into groups of 3-5 persons to vision together after an initial presentation by the researchers. Lunch (free from plastic wrappings and cutlery) was served as part of the workshops.

The framing for both vision workshops was developed internally in the project group, and despite the more technical theme of the second group, the two were considered similar enough to use the same thematic framing; cleanup, recycle and consumption. The thematic framing worked well in both groups, but the two groups as a whole did end up having slightly different emphasis in their discussions. While the first group focused more on the consumer perspective and retained a holistic view of the three different framings, the second group – the one with the technology focus – put more emphasis on the potential use of technology in all three thematic framings. They also put considerably more emphasis on cleanup and recycling than on consumption.

We also arranged two workshops with children (Table 1). The participants were recruited by the project groups' municipality representatives via emails that were followed up by phone calls. One local primary school agreed to partake and invited us to hold the vision workshops as part of the school

Participants were recruited from local businesses, and amongst municipality employees from education, politics and technical units, please see Table 1 for more details on the participants.

Table 1. Vision workshops.

Vision workshop # and theme	Date, time and location	Participants	# of groups
Vision workshop 1 for "Plastic neutrality" (holistic focus)	2018.11.06 11.00–14.00 hrs. Kristiansund municipality	Adults: A total of 6 participants; consisting of 4 employees from Kristiansund municipality (3 from the education sector, and one representing a political party) and two representatives from local businesses.	2 groups with 3 participants in each.
Vision workshop 2 for "Plastic neutrality" (technology focus)	2018.11.07 11.00–14.00 hrs. Kristiansund municipality	Adults: A total of 12 participants; consisting of four employees from Kristiansund municipality (all from technical departments) and 8 representatives from local businesses (all active in recycling or marine sector).	3 groups with 4 participants in each.
Vision workshops 3 and 4 for "Plastic neutrality" (for children)	Two adjacent workshops 2018.11.28 and 2018.11.29 12.00–14.00 hrs. Dale barneskole	A total of 50 children (two full school classes, 5th grade)	10 groups with 5 participants in each.

day. We carried out two adjacent vision workshops between 12.00-14.00 hrs. with the school's 5th grade classes. The free minutes were carried out as on a normal school day. The original intention was to hold one workshop for each class on two different days, but after conferring with the teachers we decided to take on both classes during both days and instead divide the workshops in two parts. One reason for this was that the City Mayor could only partake in a prize ceremony for the children on day two and that the children would benefit from presenting their work for each other. Both class superintendents were present throughout both workshops and assisted in maintaining a normal school day structure. The children were presented with a contextual framing, which was co-developed with the teachers. This contextual framing was set to five different rooms or settings; at home, in the grocery store, in the classroom, in nature, and in the play context (toys). The 50 pupils were then divided into 10 groups with five children in each. As suggested by the teachers, we used the same work groups as had been used recently in another school assignment. This simplified the forming of groups as the children could relatively easily find their group members and sit down together. Each of the groups were later assigned with one room to focus on. This meant that two groups of 5 were working on each of the five framed contexts.

TWISTING FOR GROWN-UPS AND FOR CHILDREN

Once we had thematically framed the problem of "plastic waste", the second methodological pillar, twisting, was introduced. Amongst the grown-ups, we proposed a zero-vision of plastic waste in Kristiansund in each thematic framing (cleanup, recycle and consumption) and gave examples on how this could be implemented in practice. Here, we exemplified with for instance a total ban for any plastic in grocery shops or at certain locations in the city, free plastic waste collection services for all citizens in Kristiansund, and the possibility to pay for the local boat that takes passengers between the different islands of Kristiansund with plastic waste. Based on the suggestions and discussions in the groups, the adults responded well to the presented ideas and on the challenge of plastic neutrality for Kristiansund. They referred to and built on previous activities as well as coming up with new ideas together.

The children were instead encouraged to take on a pair of "plastic goggles" and to identify all plastic in their groups' context or room. The children were not allowed to change rooms between the groups or to exchange group members as this was believed to risk taking focus away from the actual workshop theme. The twisting with regards to the children was to remove all plastic in their context. We also gave the example of replacing all plastic with something else and mentioned "wood" and "wool" as alternatives to consider. This challenge worked very well for all groups and helped boost imagination, which was demonstrated by the playfulness of the ideas that were later developed and presented by the children.

USING FOR GROWN-UPS AND FOR CHILDREN

The using pillar was only partly included in the case study due to the limited amount of time available (September 29th to December 31st, 2018). As part of a full-scale project, and in the continuation of the Kristiansund case, the ideas and thoughts that were expressed in the workshops should be included in the municipalities' continued work with the goal and vision and should also be continually followed up with communication both with the workshop participants directly, and as part communication and information to the general public, via social media as well as via other channels (including local press and media). Also, new workshops involving other and additional stakeholders in the community should be held as part of a long-term strategic work with the set vision and goals.

The adults were divided into groups during the workshop and asked to elaborate on the thematic framings and the challenge/goal of plastic neutrality in this sector. The groups were given drawing materials (papers and pens of different colors) and were divided into groups that worked together for 90 minutes. The groups were facilitated by one or more of the core project team members, who also took notes. In addition, the group discussions were also audio recorded to enable the use of actual quotes in research. The groups were encouraged to use the three thematic framings, cleanup, recycle and consumption,



Figure 3. The children listening intently during the workshop introduction. (Photo: Tore Lyngvær.)

when presenting their solutions and ideas in plenum. To exemplify, the workshop discussions revealed that Kristiansund as a community identifies a lot with the Ocean. The relation was described as almost "symbiotic" and the beautiful archipelago and the long shorelines along the islands that constitute the municipality were described as a fantastic resource. However, the relatively remote location was also considered a problem as many industries had been put out of business, leaving the community with very few work-opportunities, especially for the young. The traditional fishing industry, with local fishermen and their boats and the surrounding industries (https://www. lifeinnorway.net/kristiansund-small-town-big-personality/), was once the main source of income, and also formed the "way of life" in the community. After the fishing community faded, the oil industry took over as a major source of employment and as a new sea-based foundation of the local economy. The oil industry also attracted and gave opportunities for high-tech and specialized businesses and start-ups in the whole region. When the oil industry reached a crisis several years ago, Kristiansund was left with fewer businesses and a lack of jobs. During the workshops, however, plastic waste was discussed not only as a problem, but as a potential business opportunity.

Plastic that floats ashore is generally perceived as something negative. But plastic is a wonderful resource as long as it doesn't end up in our oceans. (Participant, Vision Workshop, Day 2)

Especially in the more technical workshop, the discussions were largely optimistic, and plastic was perceived as the basis of a potential new sea-based industry, involving plastic waste management and recycling. This plastic industry would in turn generate jobs, and attract businesses and start-ups, just like the oil did when the fishing industry faded. Several new concepts and ideas were elaborated in the groups, and the second workshop also lead to the establishment of a cooperation between two local businesses that had not previously cooperated, one company that was developing a grab bucket machine for collecting plastic waste from the sea bed and a local business that is in the process of opening a local plastic recycling plant. The possibility of starting up a new education for advanced plasticspecialized engineering was yet another interesting idea that was brought up by the same participants, as was the potential cooperation between business, research and education.

We might be able to create yet another sea-based economy here. We have always lived from the ocean. We could call it "living from the ocean" version three-point-zero (v.3.0). (Municipality employee A, Vision Workshop, Day 2)

It was suggested in one of the groups (also during the group works on Day 2) to include not only the remaining local competencies and businesses from the high-tech oil industry in the creation of this new economy, but that the more traditional fishing industry might get a plastic quota instead of a fishing quota and get paid for fishing up their own fishing ropes and other plastic waste from the ocean. The idea was largely sprung from the ironic discussion on how we are now being confronted with nature's vomit, that consists of our own shortcomings.

Now we see how material from the fishing industry and now also from the oil platforms are floating ashore together with other plastic waste. It's easy to see the irony of meeting yourself in the doorway. (Participant, Vision Workshop, Day 2)

In the other vision workshop, Day 1, teachers from local schools participated and were represented in both groups working with the assignment. Here, discussions were largely based on possible campaigns and activities that would involve citizens in general, and children in particular. The possibility of involving school children in cleaning up the plastic waste from shorelines was considered highly relevant. The schools had previously participated in beach-cleanup activities, but it was suggested to include the plastic waste problem not only in separate campaigns involving school children, but to include it as part of the school curriculum as such. The idea to carry out vision workshops with school children was also sprung from one of the groups in vision workshop Day 1, and this actually contributed to our decision to carry out similar workshops to test the methodology on another participant group.

Amongst the children, each group was given the challenge of eliminating all plastic they could do without or replace in their specific "room" or context and were each given a large white paper ($841 \times 1,189$ mm, A0) and had available a surplus of coloring pens, scissors, paper glue and scrapbooking materials, including magazines and promotion material from shops. The group works was initiated on the first workshop day and the children were given day two of the workshop for finishing their assignment and present. All groups worked together for 90 minutes. The groups were facilitated by the core project team members and the teachers who rotated between the groups. On day two, the children were also informed of the City Mayor's visit and the forthcoming prize ceremony in a room that was used for school gatherings and performances. This motivated the children and clearly the prospect of winning some kind of award appealed to many of the groups. During the group works, all groups worked well and intensely with their task, and all produced posters that included both text and mixed-media illustrations. The children were more than willing to make do without many of the products that are part of everyday life, including video games and game consoles. To exemplify, one group that had the home as their room suggested to remove the resealable screwcaps on milk cartons. One group concluded orally as well as in writing on their poster:

You grown-ups have made a mess – now it's up to us children to make it right! (The play/toy group A, Vision Workshop, day 2)

Both the groups working within the classroom arena brought up the problem of not having recycling units for plastic and paper in their classroom. The school did, however, have access to recycling stations in the near vicinity and their suggestions was that they started recycling as soon as possible. The teachers confirmed that the classrooms would need containers for recycling different materials, but that the school budget did not include the cost of such a solution.

Many children also pointed out the fact that we did have plastic materials amongst the scrapbooking tools provided to them during the workshop, and we could only agree and ask for their advice in what materials to use instead. One of the "nature" groups suggested a special kind of "fishing" net that would collect plastic in the ocean but let the fish pass unharmed through it. Of course, this idea cannot be put into practice without advanced technology development, but the idea demonstrates the willingness to experience and to find solutions. Another group suggested they would build a one room beach hotel or cabin using only plastic waste from the ocean. This cabin would illustrate the problem as well as being used to house tourists.

After conferring with the teachers and the school headmaster, we addressed the lack of recycling bins for separating waste in the classroom by awarding the children with a waste sorting unit for each classroom. The children were eager to get started with their recycling of plastic and other materials and the teachers had committed to support the recycling of the sorted materials. After conferring with the teachers, it was decided to declare all of the groups as winners, with a motivation for each group. After the prize ceremony all were served cinnamon buns and "julmust" in the auditorium. During this time, four different children took the opportunity to ask if we would like to come back and visit them again.

A CRITICAL REFLECTION ON THE METHODOLOGY

Since the Kristiansund case was the first application, we need to critically reflect, in how far the methodology with a confrontative step, followed by the framing, twisting, using steps contributed to solutions that other methodologies would not have provided. As already pointed out, the confrontative step was – mostly for reasons of time and budget restrictions – rather



Figure 4. One of the groups holding their poster after sharing their ideas and results in the vision workshop (day 2). (Photo: Tore Lyngvær.)



Figure 5. The children holding their individual diploma after getting positive feedback on their work from the researchers in plenum. The City Mayor, who handed out each diploma to the children, is present on the picture. In the foreground, the awards, waste recycling units for sorting plastic, paper and glass in the classrooms. The posters were mounted on the walls and left as exhibition. (Photo: Tore Lyngvær.)

limited. Whereas the concept as outlined in the first section builds on unexpected onfrontation with eco-vizualisation that gets people out of their comfort zone, the pilot project used vizualisations created by nature itself. However, the labelling of these plastic piles as "nature's vomit" framed them in a new way, which fueled the imagination of the workshop participants. In the following framing, twisting, using steps, this initial energy was taken on. Furthermore, it was very clear in our experience that the social aspect of the workshops both increased the perceived effect of the actions and the enjoyment and social support of the participants, empowering them. However, within the limited setup that could be realized in the pilot, the whole innovation potential of the methodology was not unlocked. The initial confrontation was rather limited, and since no artistic twist of the visuals was used, the potential for disrupting expectations and established assumptions was only partly taken out. The number of workshops and participants was limited and the transformative power of the process was thus limited aswell. Most importantly, the continuity of carrying the transformation ideas further through the societal system needs to be established with stakeholders and the community in a more commiting way as could be realized in the pilot.

Next steps: A second pilot

Based on the final reflections in the previous paragraph, the NIYF methodology is perceived as promising, but needs more research and development to be fully effective. As the NiYF methodology is intended to be useful in addressing different challenges in different contexts, the methodology should be versatile and easily adapted to other challenges and various participant groups. To demonstrate the versatility of the methodology, and to give an indication of the road ahead, a case study for a full-scale research project has been drafted together with Trondheim Municipality (TK). TK has done extensive experimentation on participation, for instance through the 2017 Augmented Democracy Program (https://www.facebook. com/688648314498316/posts/1970517426558838), which concluded that the complexity of the challenges make it difficult for citizens to fathom the options available to them. Hence, the challenge in Trondheim is to actively involve citizens in city development and planning with regards to a large number of specific challenges in the urban environment. The plan is to involve citizens, especially kindergartens (https://www.trondheim.kommune.no/oya-bhg/), in creating eco-visualizations on specific pre-defined themes located in hubs or stations along an urban pathway that runs through an area that is up for major (re-)developments (https://www.trondheim.kommune.no/ sluppen). Children will be provided with technical expertise, resources and support from relevant competencies (including local artists and authors) for realizing the eco-visualizations. The following table describes the hub concepts that will be used as a starting point for this second case study. The concepts have partly been developed by master-students of the Experts in Teams (https://www.ntnu.edu/studies/msrams/experts-in-ateam) course on "alternative environmental communication" (https://www.ntnu.no/eit/psy3809) and involve more radical disruptions of everyday life than could be implemented in Kristiansund.

The planned project in Trondheim uses the aforementioned three pillar methodology as part of a digital user interface for participation in city planning. Naturally, the methodology will be adjusted to work in a digital setting via an app for user involvement. The framing in this case will be thematic (see Table 2) while the twisting phase involves following up on these provoking and somewhat disturbing discussions via discussions and challenges. The using phase consists partly on actual changes and influence on the city development. In addition, the using is communicated via the digital interface and via social media.

Conclusions

In the project described herein, we have tested and further developed the NIYF approach in relation to a specific pressing environmental issue and challenge, in a Norwegian municipality. By realizing the NIYF idea in the Kristiansund case, and demonstrating its feasibility, we have verified the practical usefulness and potential of the methodology, but also identified critical issues for its implementation. We feel confident that the NIYF methodology is versatile enough to be successfully used in other (municipality) contexts and in addressing many of the worlds pressing environmental issues. The project goal that is to be supported by the NIYF methodology needs to be sufficiently founded in the problem owners'organization, as the experiences from Kristiansund show where the results are only partly taken further. Therefore, starting with an actual problem that is already at least partially defined in the municipality is an advantage. Preferably the problem or issue that is to be solved should be a major priority in the municipality. If not, it may be difficult for the municipality to put work hours and resources into the project and it may take a long time to approach dealing with a specific challenge and set ambitious goals to achieve. If the defined problem or issue is already visible in the community, as it was in Kristiansund, this is of course an advantage with regards to confronting people wit-h the problem. However, creating eco-visualization concepts to illustrate less obvious topics or to highlight already present problems is indeed a possibility, and it might be an arena where the NIYF approach unfolds its true potental. There is a growing number of artists addressing environmental issues and climate change in different ways (https://www.nytimes. com/2018/08/22/t-magazine/climate-change-art.html). The

use of technology to visualize sensor data such as air pollution or traffic patterns is but one possibility. As mentioned earlier, the Kristiansund case-study will be used as a starting point for additional projects. Based on the results of the performed case study, the NiYF methodology may offer a way forward that does acknowledge the need for major changes in at individual and societal level and invites citizens, municipalities, businesses and research to co-create visions and solutions finding a needed new pathway that shifts the focus away from the prevailing emphasis on retaining comfort towards an emphasis on engaging in new, maybe disruptive solutions. In particular, the children - but also the adults - proved to be more than willing to limit consumption, and the happiness, innovativeness and creativity that was displayed during all vision workshops far exceeded the researchers' expectations, also underlining the important social aspect of the methodology for creating a momentum. Using this experience as a point of departure, we are confident that the NiYF methodology successfully approaches the need for major changes in the way we use resources on individual and societal level and offers a way forward. It confronts individuals and groups with the challenges of global climate change by means of confrontative eco-visualizations, stimulates their social interactions - which in itself is a contribution to non-consumption based well-being - and offers a stepwise path forward to achieve a joint mobilization of resources and ideas in solving the challenges we are facing. Hopefully, the results of future projects will provide not only a methodology that contributes to new ways of coping with the barriers of creating regenerative cities but also deepen the understanding on how to codesign and gain acceptability for new and perhaps challenging policies.

Table 2.	The prel	iminary	eco-visualization	is develo	oped fo	or hubs a	along the	urban pathway.
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Eco-visualization concept	Description; supports discussions on
Lung trees: visualizing sensor-based air pollution data	Data is visualized as lungs in trees that are breathing in and out. Visual movement is accompanied by sounds of breathing that becomes more strained as the air quality decreases. Supports discussions on how to improve the air quality by minimizing traffic.
Whispering forest: poetry and storytelling	Trees are whispering poetry and telling stories in a serene spot. Users can add own content. Supports discussions on the potential use of urban spaces.
Human zoo: human behaviour under the magnifying glass	Watching humans as they hurry to and from buses and pass by in their cars on one of the busy traffic spots of Trondheim from inside a "green pocket". The contrast of the serene nature in a green pocket and the busy life outside is illustrated by a window in the green wall. Supports discussions on means of transport and traffic solutions.
Nature strikes back: old buildings	An old building in a bad condition is located along the path. By means of light projection, it will appear as if it falls down, brick by brick, nature reclaims it. Supports discussions on the future of poorly maintained buildings.
Nature strikes back: reclaimed infrastructure	The old Sluppen car bridge will be remade for pedestrians and cyclists as part of the new Sluppen area. Sensors trigger a partial "flooding" of the bridge, and microorganisms or fish will jump over the passing cyclist. Supports the discussions on loss of comfort or convenience and switches the scales.
Big city data light-show	The newly built Sluppen Lysgård (http://www.lysgarden.no/?gclid=EAlalQobChMli Lnmi8PB2QIVBkMZCh0-QAyEEAAYASAAEgJ7XfD_BwE) has advanced light pro- jection technology that is put to our disposal by our cooperation partner Kjeldsberg. This enables us to visualize big data (traffic et cetera) in creative ways. Supports discussions on a holistic city scale.

References

Ahuvia, A. C., (2017), "Consumption, Income and Happiness", in *The Cambridge Handbook of Psychology and Economic Behaviour*, Ed. Alan Lewis, Cambridge University Press.

Ahuvia, A.C. (2015) Nothing Matters More to People than People: Brand Meaning, Brand Love and Social Relationships. Review of Marketing Research Special Issue on Brand Meaning Management, 12, 121–149. http://doi. org/10.1108/S1548-643520150000012005.

- Csikszentimihalyi, M., & Hunter, J. (2003). Happiness in everyday life: the uses of experience sampling. Journal of Happiness Studies, 4(January), 185-199. http://doi. org/10.1023/A:1024409732742.
- Dunne & Raby (2013) Speculative Everything: Design, Fiction, and Social Dreaming, MIT Press, ISBN: 9780262019842.
- Feola, G. (2015). Societal transformation in response to global environmental change: a review of emerging concepts. *Ambio*, 44 (5), 376–390.
- Folke, C., Carpenter, S., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience thinking: integrating resilience, adaptability and transformability. *Ecology and society*, 15 (4).
- Fritsche, I., Barth, M., Jugert, P., Masson, T., & Reese, G. (2017). A social identity model of pro-environmental action (SIMPEA).
- Gray, Brown & Macanufo (2010) Game storming; A Playbook for Innovators, Rulebreakers, and Changemakers, O'REILLY.
- Kitzinger, J. (1994) The methodology of focus groups: the importance of interaction between research participants, *Sociology of health & illness*, 16 (1994) 103-12, https://doi. org/10.1111/1467-9566.ep11347023.
- Klöckner, C. (2015) The Psychology of Pro-Environmental Communication: Going beyond standard information strategies. Palgrave Macmillan. 2015. ISBN 978-1-137-34831-9.

- Löfström & Svanæs (2017) Eco-visualization: an exploration of the concept and its practical implications, Proceedings of eceee 2017.
- Löfström, E. (2008) Visualizing Energy in Households the De-domestication of Socio-Technical Systems and Individual- as well as Artefact-bound Energy Use/Academic dissertation, Dept. of Thematic studies – Technology and Social Change, Linköping University, Sweden.
- Löfström, E. (2014) Smart Meters and People Using the Grid: Exploring the Potential Benefits of AMR-Technology, in Energy Procedia 58 (58): 65–72, December 2014.
- Miles, M. (2010) Representing nature: art and climate change/ Cultural Geographics, http://www.sagepub.co.uk/journalsPermission.nav, DOI: 10.1177/1474474009349997, SAGE, UK.
- Rosso, Brent. (2014). Creativity and Constraints: Exploring the Role of Constraints in the Creative Processes of Research and Development Teams. Organization Studies. 35. 551–585. 10.1177/0170840613517600.
- Russell, R., Guerry, A. D., Balvanera, P., Gould, R. K., Basurto, X., Chan, K. M., Resources. (2013). Humans and nature: how knowing and experiencing nature affect well-being. *Annual Review of Environmental Resources*, 38, 473–502.
- Shove, E., Pantzar, M., & Watson, M. (2012). *The dynamics of social practice: everyday life and how it changes*. London: Sage.
- Støa Larssæther & Wyckmans (Eds) (2014) Löfström, E., Supporting low-emission lifestyles: involving future residents at Broset, Chapter in Book, Utopia Revisited. Towards a Carbon-Neutral Neighborhood at Brøset. Fagbokforlaget. 2014. ISBN 978-82-450-1725-0.)
- Zhang, J.W., Howell, R.T., Caprariello, P.A., & Guevarra, D.A. (2014). Damned if they do, damned if they don't: Material buyers are not happier from material or experiential consumption. *Journal of Research in Personality*, 50 (1). http:// doi.org/10.1016/j.jrp.2014.03.007.
- Zuzanek, J., & Zuzanek, T. (2014). Of happiness and of despair, is there a measure? Time use and subjective well-being. Journal of Happiness Studies, 1–18. http://doi. org/10.1007/s10902-014-9536-1.