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APPROACH TO MITIGATE CLIMATE CHANGE

- Promoting 1,5-degree lifestyles

MASTER'S THESIS | ABSTRACT

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APPROACH TO MITIGATE CLIMATE CHANGE

- Promoting 1,5-degree lifestyles

The thesis was commissioned by the Climate and Environmental Policy Unit of Turku and its campaign 1,5-Degree Life that develops climate communication towards the residents. The output of the thesis process was six prototypes of climate-friendly Turku residents and their stories. The process utilized service design methods and co-development, and the process followed a double-diamond framework

The 1,5-degree lifestyle described in the thesis supports climate goals. The theoretical framework deals with climate change and briefly presents the factors influencing national climate policy and the factors related to 1,5-degree life. Because the campaign 1,5-Degree Life aims to motivate and inspire residents to mitigate climate change by changing their behavior, behavioral economics and nudging were seen as an integral part of the theoretical framework. The study concludes that the most effective ways to motivate and encourage people to lead a more environmentally friendly lifestyle are receiving feedback, creating positive images, and ultimately making the topic a socially acceptable norm. The stories and the tips and practicalities shared to reduce an individual's carbon footprint aim to steer residents in the desired direction for the environment. In addition, challenges related to municipal communication have been considered.

KEYWORDS:

Climate change, 1,5-degree lifestyles, behavioral economics, nudging, storytelling

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LÄHESTYMISTAPA ILMASTONMUUTOKSEN HILLINTÄÄN

- 1,5 asteen elämäntapojen edistäminen

Opinnäytetyö tehtiin Turun kaupungin ilmastotiimin toimeksiantona ja tavoitteena oli tuottaa sisältöä ilmastotiimin 1,5-Asteen Elämää kampanjalle. Prosessin lopputuloksena syntyi kuusi ilmastoystävällisen turkulaisen prototyypin ja heidän tarinansa. Prosessissa hyödynnettiin palvelumuotoilun menetelmiä ja yhteiskehittämistä ja prosessi noudatti tuplatimanttimalia.

1,5-asteen elämäntapa, jota opinnäytetyö kuvaa, tukee ilmastotavoitteita. Opinnäytetyön teoreettinen viitekehys käsittelee ilmastomuutosta ja kansalliseen ilmastopolitiikkaan vaikuttavia tekijöitä sekä esittelee 1,5-asteen elämään liittyviä tekoja. Koska 1,5-Asteen Elämää kampanjan tavoitteena on motivoida ja innostaa kaupunkilaiset osallistumaan ilmastotalkoisiin muuttamalla omaa käyttäytymistään, käyttäytymistaloustiede ja tuupaus koettiin olennaiseksi osaksi teoreettista viitekehystä. Tutkimuksen perusteella voidaan todeta, että tehokkaimpia tapoja ihmisten motivoimiseen ja tuuppaamiseen kohti ympäristöystävällisempää elämäntapaa, ovat palautteen saaminen, positiivisten mielikuvien luominen ja asian saattaminen sosiaalisesti hyväksyttäväksi normiksi. Tarinoilla ja niiden tarjoamalla vinkeillä yksilön hiilijalanjäljen pienentämiseksi pyritään tuuppaamaan kaupunkilaisia ympäristön kannalta toivottuun suuntaan. Tämän lisäksi kunnalliseen viestintään liittyvät haasteet on pyritty ottamaan huomioon.

ASIASANAT:

Ilmastomuutos, 1,5-asteen elämäntavat, käyttäytymistaloustiede, tuupaus, tarinankerronta

CONTENT

1 INTRODUCTION	7
1.1 Background of the Thesis	8
1.2 Goals and Research Problem of Thesis	9
1.3 Design Process and Schedule	11
1.4 Research and Service Design Methods Used in the Thesis	16
2 THEORETICAL FRAMEWORK	23
2.1 Climate Change	23
2.2 Climate Policies	25
2.3 1,5-degree lifestyle.....	28
2.4 Behavioral Economics and Nudging	32
2.5 Information Design.....	38
2.6 Storytelling	39
3 CONTENT CREATION PROCESS FOR CLIMATE COMMUNICATION.....	42
3.1 Discover.....	42
3.2 Define	43
3.3 Develop	45
3.4 Deliver	55
4 RESULTS	63
5 CONCLUSIONS AND EVALUATIONS	64
REFERENCES	66

APPENDICES

Appendix 1. Affinity diagram

Appendix 2. Invitation to workshop

Appendix 3. Value Proposition Canvases

Appendix 4. Value Proposition Canvases

Appendix 5. Value Proposition Canvases

Appendix 6. Emotional Journeys

Appendix 7. Emotional Journeys

Appendix 8. Emotional Journeys

Appendix 9. Feedback Survey

Appendix 10. Feedback Survey

Appendix 11. Original wordclouds

Appendix 12. Original wordclouds

Appendix 13. Story of Janne

Appendix 14. Story of Ella

Appendix 15. Story of Eva

Appendix 16. Story of Anna

Appendix 17. Story of Ossi

Appendix 18. Story of Eero

FIGURES

Figure 1. Stakeholder map.....	9
Figure 2. Frame of Reference	11
Figure 3. Four characters with different lifestyles and values towards 1,5-degree lifestyles (Impiö, Lähteenoja, & Orasmaa 2020).	12
Figure 4. Design process and timeline	13
Figure 5. Status Quo before the 1,5-Degree Life campaign	14
Figure 6. Estimated scenarios of global average temperature rise (Ilmasto-opas 2021; Ilmatieteenlaitos 2021).	28
Figure 7. Finnish carbon footprint (Lounasheimo, Cederlöf, & Mäntylä 2021, 6).	29
Figure 8. Affinity diagram (Sitra, 100 fiksu arjen tekoa n.d.; Susla n.d.;	32
Figure 9. Empty Scenario Map canvas	45
Figure 10. Empty Empathy Map Canvas.....	46
Figure 11. Empty Turku- Mind Map canvas.....	46
Figure 12. Empty Persona canvas	47
Figure 13. Persona Canvas - Teenager	49
Figure 14. Value Proposition Canvas - Anna	50
Figure 15. Emotional Journey Map - Eva	51
Figure 16. Janne.....	57
Figure 17. Ella	58
Figure 18. Eva	59
Figure 19. Anna	60
Figure 20. Ossi	61
Figure 21. Eero.....	62

TABLES

Table 1. Summary of Motivation Profiles (Huumo, Kaitosalmi, Tuomisto, Kavenius, & Tikkanen 2019).....	36
Table 2 Statistics of Turku (Turku n.d.)	44
Table 3. Feedback survey questions and summary of responses	52

1 INTRODUCTION

Climate crisis refers to the series of problems caused or likely to be caused by changes in the world's weather. In particular, the world is getting warmer because human activity increases carbon dioxide levels in the atmosphere.

The debate over whether resolving the climate crisis rests on the shoulders of an individual or in societal structures should give way to constructive dialogue and actions. Consumption habits have traditionally received little attention in mitigating climate change. Most of the policy action to address climate change focuses on societal acts such as improving energy efficiency and increasing renewable energy sources (Ministry of Economic Affairs and Employment 2019).

However, the importance of lifestyle changes has lately started to emphasize. The target to limit global warming to 1,5 degrees Celsius, as agreed in the Paris Climate Agreement (Ministry of Environment n.d.), requires systemic change and the engagement of all market participants. Countries and cities alone cannot reduce all emissions in their areas, but individuals and businesses are also needed. Besides, societies are made up of individuals. The part that individuals and households hold the responsibility for is their behavior and consumption habits.

A positive development is traditionally related to the increase of consumption and economic growth. Continuous overproduction and -consumption, among others, have sped up climate change and the use of natural resources at such a speed that it is estimated that by 2050 the consumption has increased to the demand of three globes. (The European Commission 2020.) The overconsumption day is earlier every year, and for example, in 2021, in Finland, it was four months before the global average, on April 10th (WWF n.d.).

With our current lifestyles, the average global temperature threatens to rise by 1,5 degrees from pre-industrial times as early as 2030-2052 and by three degrees by 2100, based on the emission reduction plans decided so far by all countries (Lettenmeier, Akenji, Toivio, Koide & Amellina 2019, 11). In addition to issues directly related to weather, the limitations of the globe, and the discomfort of development are unevenly distributed globally, and tensions caused by the inequality reduce the integrity of societies and trust between the citizens (Salonen & Bardy 2015).

However, despite the painted horror pictures, the course of development is still possible to change, and good life should be pursued within the limits of one globe. Ecosocially

civilized individuals recognize the interdependencies between ecological, social, and economic reality, and understanding those interdependencies build trust in the future. Ecosocial civilization is the cornerstone in achieving mutual benefit between the bearing capacity of the globe and the modern economic paradigm. (Salonen & Bardy 2015.) Bearing capacity refers to the limit where the burden on nature becomes exceeded and causes irreversible environmental damage threatening the well-being and survival of humankind (Lettenmeier & al. 2019, 12). Continuous growth and use of natural resources are in contradiction with the bearing capacity of the globe.

The commissioner of the Master's Thesis is the Climate and Environmental Policy Unit of the City of Turku and its campaign 1,5-Degree Life that develops the climate communication towards the residents. The request is to create a content for climate communication. The objective of the Paris climate agreement is to stop global warming to 1,5 degrees (Ministry of Environment n.d). Referring to the Paris agreement, the lifestyle that this Master's Thesis describes is named a 1,5-degree lifestyle. 1,5-degree lifestyle supports the climate goals, and there are several ways to put a climate-friendly lifestyle into practice.

Changing consumption patterns is a conscious activity and just as tricky as one decides to make it. However, the most important thing is to consider individual possibilities and adjust the actions to one's lifestyle. The ultimate objective of this Master's Thesis is to encourage everyone to adopt resource wisdom and climate-friendly ways of living that are suitable for oneself.

1.1 Background of the Thesis

The City of Turku's climate politics is aiming for carbon neutrality by 2029 (Turku n.d). Carbon neutrality refers to the city's commitment to reduce the net effect from human activity on climate to zero or to offset specific sector's emissions by reducing them somewhere else by the target deadline (European Parliament 2021).

Achieving climate targets needs collaboration, and in addition to the city's measures, it needs to get society broadly involved. The Climate and Environmental Policy Unit has established a 1,5-Degree Life campaign by which Turku aims to encourage residents and companies to make climate-friendly choices. (Turku n.d.) Turku has already developed the Climate Team concept, which offers a database and network for companies and communities for their sustainable solutions. Approximately 80 climate actions have already been compiled in the database on the Carbon Neutral Turku 2029.

Climate objectives and sustainable solutions also form an integral whole for the region's vitality and business development. (Päätöspöytäkirja 2020.)

The commission links to the project Taklataan Ilmastoahdistus! (Let's Tackle Climate Anxiety!) - Development of empowering climate communication and actions. The project is funded by the Ministry of the Environment. As part of this project 1,5-Degree Life campaign was implemented between May 1st, 2020, until November 30th, 2021. Thus, the project partly promotes and supports the ambitious goal of the City of Turku in its Climate Plan 2029: climate actions by companies and citizens and extensive cooperation to create solutions to climate change in society. (Päätöspöytäkirja 2020.)

Taklataan Ilmastoahdistus! -project develops climate communication that is identified as a critical bottleneck in achieving and accepting climate objectives. Compelling and inspiring inclusion measures will accelerate the climate actions of the city's residents and businesses. At the same time, inclusion measures diversify the means of participation by the target group. The co-operational we-spirit in climate actions also relieves climate anxiety, and the examples serve as motivation. (Päätöspöytäkirja 2020.) Stakeholders of the campaign are mapped in Figure 1.



Figure 1. Stakeholder map

1.2 Goals and Research Problem of Thesis

The objective of the Thesis is to participate in developing climate communication by creating the personas – ordinary people who live climate-friendly life in Turku. Thus, the final output of the master's Thesis targets to increase the awareness and facilitate consumers' choices by communicating the acts of 1,5-degree lifestyle to ensure that the goals of carbon-neutral Turku would be realized. The primary purpose is to encourage and motivate everyone to participate in climate work by sharing practical examples of

what can be done, yet without pointing any fingers and blaming. The objective is to apply design thinking and service design methods to create the climate-friendly personas living in Turku.

The Thesis aims to respond to the need of the 1,5-Degree Life campaign to have material that would be encouraging and easy to identify with for the audience. The campaign's objective is to increase the awareness of climate-friendly lifestyles among the citizens to reach the aim of carbon-neutral Turku 2029. Therefore, the target audience for the dialogue is the inhabitants of Turku, as everyone should be involved in the climate work to achieve the objective.

The starting point of the research leads to the following research question:

1. What choices can a consumer make to live 1,5-degree life?

The aim is to ultimately influence the behavior by providing examples of alternative courses of action. That leads to the need to recognize whether the consumers might benefit from being gently nudged towards the climate-friendly direction and to supporting research question:

2. Can consumer behavior and decision-making be motivated by nudging, and how can nudging be utilized in promoting a climate-friendly lifestyle?

In municipalities, communication belongs to everyone. The Municipal Act provides a framework for municipal communication and requires openness and interaction. The Act requires equality, and the city is a natural source of information for the resident. The activities of organizations operating in municipal services must be communicated from the perspective of the residents. Communication is a strategic tool that is a prerequisite for democracy and service and essential for any reform. Communication is a vital management tool, and the importance of interaction in management is further emphasized. Public administration that actively utilizes modern communication opportunities also inspires trust among residents and stakeholders. (Kuntaliitto 2016.)

As the intention is to develop a solution for municipal climate communication, the theoretical background is supplemented with the research question:

3. How can the solution be communicated to the target audience?

The research problem is multidimensional. First, it assumes that it is necessary to communicate the acts and objectives as clearly and equally as possible to motivate people to ecological sustainability. Second, the intention is to recognize whether the consumers might benefit from being gently nudged towards climate-friendliness. Third,

the key elements of municipal communication requirements must be considered while developing the output.

The theoretical background of the Thesis is framed in Figure 2. The theoretical background is the basis of the concept work later and should provide the critical background information that is required. To understand the environment and the limiting factors, first, the climate change and the policies addressing the national climate work are explained. For the second research question, the approach of behavioral economics and nudging is studied. Finally, for the output, the requirements for communication from the municipal act as well as information design and storytelling are examined.

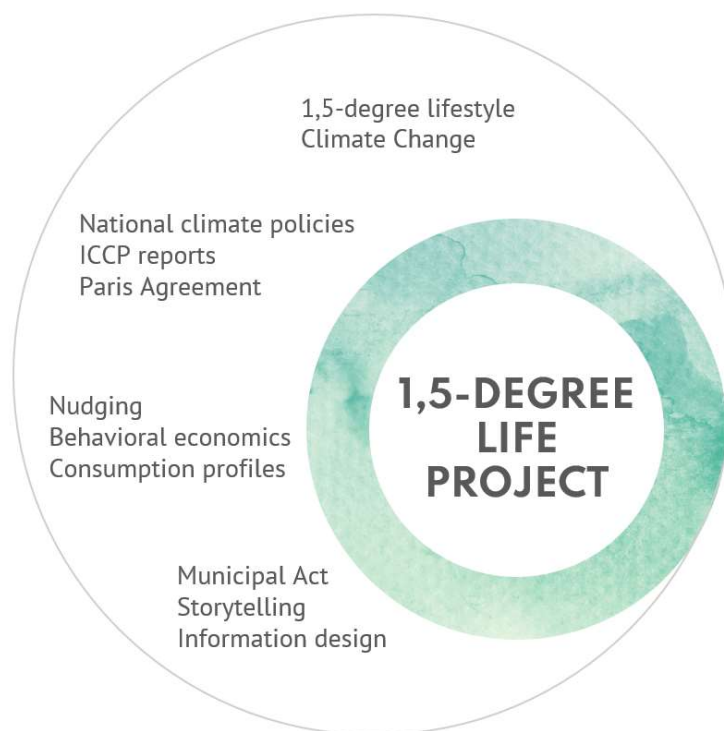


Figure 2. Frame of Reference

1.3 Design Process and Schedule

As mentioned, the goal of the service design process is to provide supplementing material for the use of a 1,5-Degree Life campaign for climate communication. The outcome of the design process is the content for communication by using the personas and their examples of sustainable lifestyles. The work is inspired by the personas created by the Finnish Innovation Fund Sitra. In 2020 Sitra presented examples of four characters with different lifestyles and values and their pathways to 1,5-degree lifestyles by 2030 (Figure 3) in its publication Pathways to 1,5-degree lifestyles by 2030. The personas describe examples of lifestyle transitions from current to 2030. The lifestyle

pathways intend to visualize the change for different lifestyles in practice. (Impiö, Lähteenoja, & Orasmaa 2020).

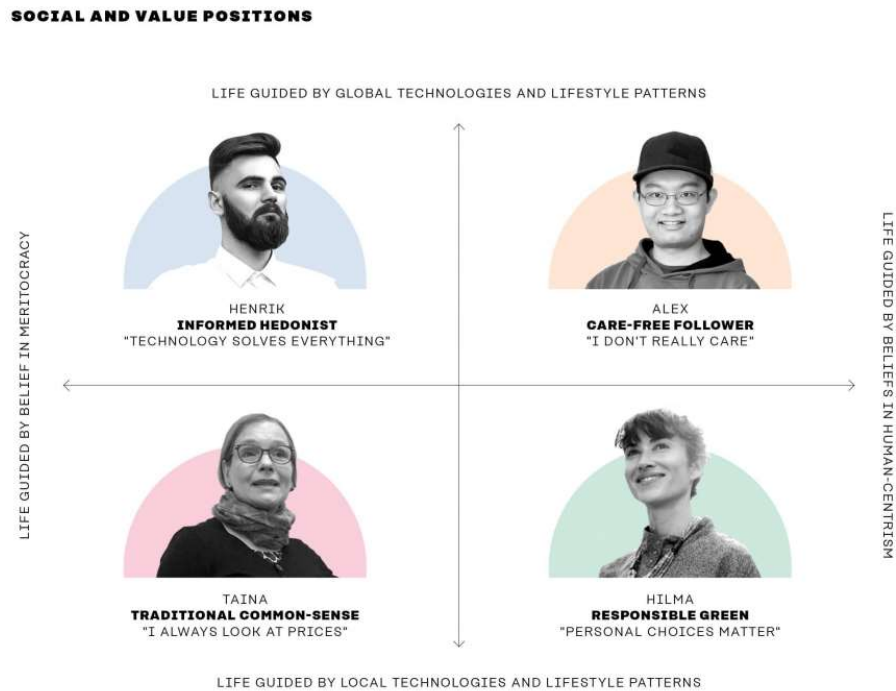


Figure 3. Four characters with different lifestyles and values towards 1,5-degree lifestyles (Impiö, Lähteenoja, & Orasmaa 2020).

Core principles of the design process are, according to Design Council, people-centredness, visual and inclusive communication, collaboration, and co-creation, and finally, continuous iteration. By applying these principles, the design process will offer a deep understanding of the usability, shared knowledge of the problem and ideas, learning and inspiring of others, as well as spotting errors and building confidence in ideas. (Design Council n.d.) In addition, design methods and tools supplement the process to reach the goal. The design process of this Thesis follows the Design Council's Double Diamond framework presented in Figure 4.

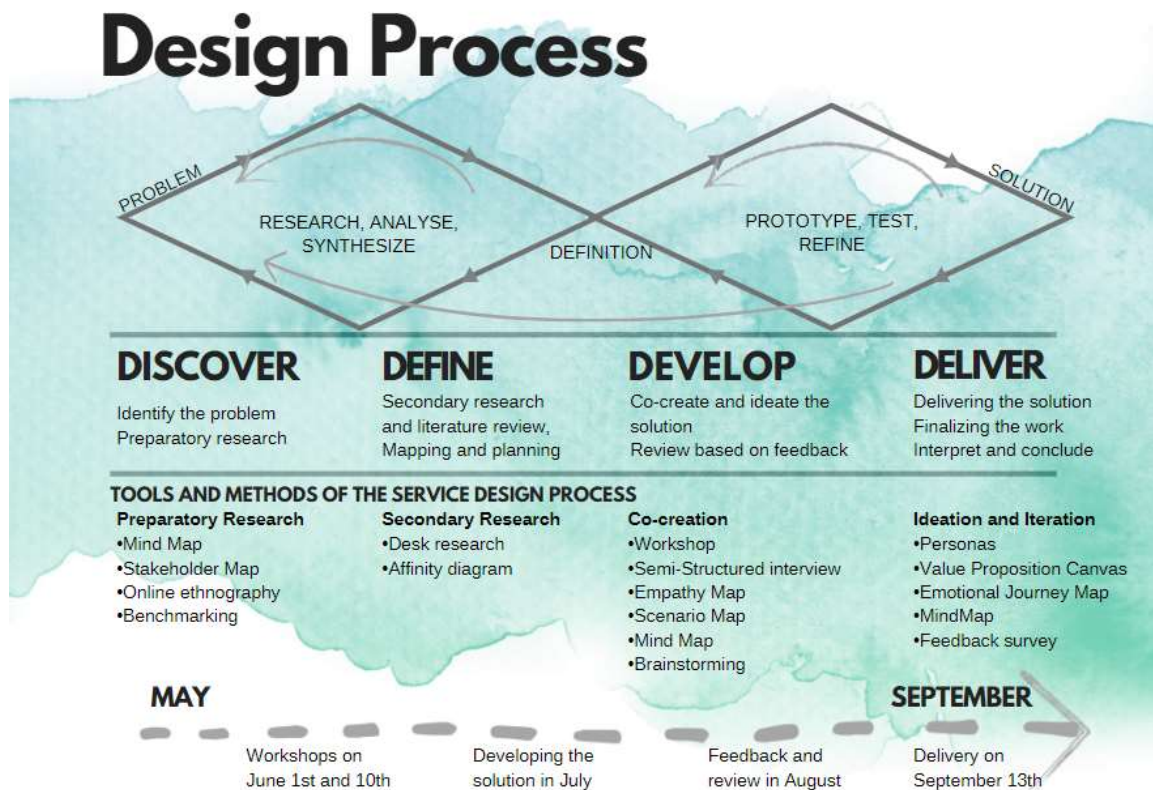


Figure 4. Design process and timeline

Design thinking refers to designers' problem-solving capacity and methodology when solving complex problems and finding desirable solutions. Design thinking aims to break out of natural thinking and behavior patterns and utilize outside-the-box thinking. The fundamental objective is to understand the users for whom the products and services are designed. The process evolves around the questions concerning the status quo – why something is done, what is currently done, and how it could be done better. The customer is in the center. By re-framing the problem by empathizing with the customer, the core of the problem is reached. (Design Council n.d.) The status quo of the climate

unit's climate communication before the 1,5-Degree Life campaign is visualized in Figure 5.

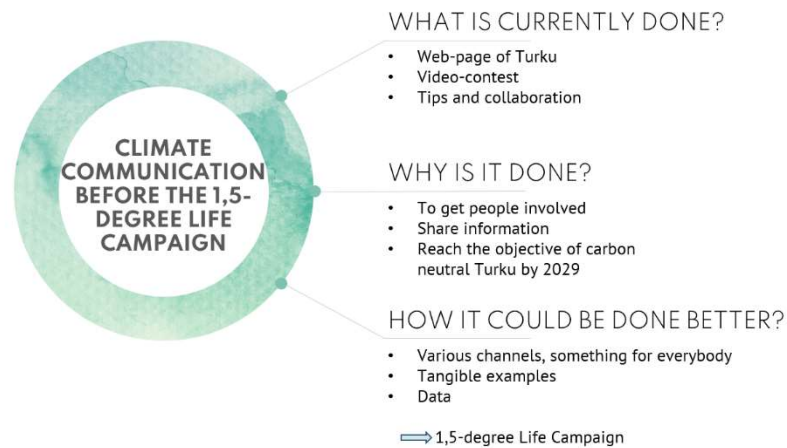


Figure 5. Status Quo before the 1,5-Degree Life campaign

Design Council's Double Diamond is a framework for transforming the design process visually interpretable. The diamonds express the process of first diverging the thinking and then focusing by convergent thinking. The process is outlined in four steps: discover, define, develop, and deliver. (Design Council n.d.)

The first diamond helps to understand and discover the problem. In this case, the discover-step is covered by the preparatory research. Whether the commission is from an external source or not, the starting point of the service design work, preparatory research, aims to learn about the industry, organization, competitors, and similar products or services or comparable experiences. At its best, the preparatory research will provide new perspectives to consider in research for further preparation and identify new stakeholders or possible team members. (Stickdorn, Hormess, Lawrence, & Schneider 2018, 6-7.)

In this case, the preparatory research includes meetings and discussions with the commissioner. Approaching the topic itself is started by benchmarking and online ethnography. By preparatory research, the core problem is addressed, and the key stakeholders identified. Key findings, among others, are the perspective to the research problem's context and common bottlenecks.

Next, the define-step outlines the Master's Thesis's scope, and in addition to discussions with the commissioner, it is covered by desk research and preliminary research. Secondary research or desk research is the part of the research implemented by using

already existing data. The purpose of desk research is to understand what kind of research regarding the topic already exists and to formulate research questions more precisely. Thus, desk research is the starting point of a research process, and the knowledge serves as a basis before the primary research. (Stickdorn, Hormess, Lawrence, & Schneider 2018, 8-9.)

The disadvantage of desk research is that research data often represents one point of view, and the use of research methods is out of desk researcher's control. Therefore, it is risky to rely on the data, especially when no scientific review is performed. Data can also be outdated. To avoid these risks, the research data should be collected from several sources. (Bhasin 2020.) As the topic is current and the buzz around the climate-friendly actions coming from everywhere, the profusion of the source material is almost overwhelming.

After the research and defining of the problem in the first diamond, the commission is developed further. In contrast to secondary research, primary research refers to self-collected research such as surveys, interviews, observations, and ethnographic research. (What is Primary Research and How do I get Started? n.d.) From here on, primary research is referred as the Co-creation and it applies desk research, co-creation in workshops, and semi-constructed interviews. The Co-creation part starts the second diamond's divergent thinking. The second diamond encourages to give different answers to the clearly defined problem, to seek inspiration from elsewhere, and to co-design with a range of other people (Design Council n.d.).

Delivery involves ideation and testing out the developed solution, the personas and their stories at a small scale, such as presenting solutions to the commissioner and iterating the initial solution with a sample audience. A questionnaire is given to the sample audience to receive feedback. Rejecting the bad ones and improving the good ones is the outcome of the delivery phase (Design Council n.d.). As the arrows in the diagram present, the process is not linear but continuously iterative. As said, no idea is ever ready. Feedback on the products and services is part of iterative improvement. (Design Council, n.d.)

The schedule of the thesis work is roughly visualized in Figure 4. The plan is to devote to the research and the development work between the late spring and early autumn of 2021. The first seminar will be held in March 2021. The work is presented in the second seminar at the end of August 2021 and the third final seminar in November 2021. Practical implementation of the process is detailed in phases, and the output resulting from the work is presented in Chapter 3.

1.4 Research and Service Design Methods Used in the Thesis

Simultaneously with desk research, the creative process is started. The use of service design tools and methods can provide an in-depth understanding of user behavior, preferences, and needs, enabling new solutions (Design Council 2015). For completing the process, a selection of research and service design methods and tools are utilized. The utilization of methods and tools is also visualized in Figure 4. The procedure is presented in chronological order. The application of each method in practice is described in Chapter 3.

Mindmapping

A mind map is used for collecting and analyzing different information throughout the thesis process. A mind map is a tool for collecting ideas and perceiving, structuring, and presenting concepts, content, or issues. The overall picture of the topic in question is easier to outline and remember from a visual image. A mind map can outline the service being designed and detect all connections and interactions between the touchpoints. (Tuulaniemi 2011, Chapter 2.)

A mind map of all discussions is created, and it is supplemented along the process. The initial mind map is later transformed to become the stakeholder map of the project. An initial mind map is only for personal purposes, but the stakeholder map is visualized in Figure 1.

Stakeholder mapping

A stakeholder map is a visual tool that represents the parties who influence the project and how they connect. Usually, stakeholders are evaluated in a system according to a specific prioritization. One of the simplest ways to prioritize stakeholders is to rate how important each one is from a customer's point of view. In B2B, the evaluation can be done on a contact level between a stakeholder and the organization, from direct contact to semi-direct to indirect contact. (Stickdorn, Hormess, Lawrence, & Schneider 2018, 46.) In this context, the stakeholders are evaluated at a contact level without prioritizing.

Online Ethnography

Online ethnography or netnography is a qualitative research analysis method that collects data from virtual communities to gain insights and analyze the user experience (Rahm-Skågeby 2011). In this case, netnography is used for gathering insights mainly from different climate-friendly social media influencers and bloggers, and discussion channels. Discussions are related either to a climate-friendly lifestyle or to life in the

Turku region. Data is gathered from discussions channels by starting own topics as well as researching the old ones. Also, relevant Facebook group discussions are monitored. From relevant parts, minor insights through online ethnography are gathered and used to supplement the co-creation work of the personas.

Benchmarking

Benchmarking is adopting others' processes and then adapting the lessons learned to own processes, yet it is not copying. It is the process of identifying, understanding and adapting outstanding practices from organizations anywhere in the world to improve performance. (Tuominen 2016, 15-16.)

Benchmarking should be considered a continuous measuring process instead of a single random act, and it should always result in an improvement. In the most successful scenarios benchmarking process leads to mutual benefit, and both parties can learn from competitors. However, as said, benchmarking is not just copying. Instead, it requires self-assessment and the ability to translate practices that work in other contexts into a process appropriate to implement in own organization. Effective benchmarking requires a trustworthy environment, cooperation, and learning between organizations. The objective is to create a win-win situation. (Tuominen 2016, 15-16.)

According to Tuominen (2016, 27), benchmarking can be divided in three categories: strategic, performance, and process. Strategic benchmarking uses the process to determine the opportunities for strategic change initiatives in core businesses by benchmarking top companies in non-competitive industries. Performance benchmarking is the business performance analysis of competitors, and process benchmarking is the performance analysis of the critical processes of identified best-practice companies in any industry.

In this study, as part of the preliminary research, benchmarking processes are used to identify the climate politics that other Finnish or neighboring European capitals have adopted, what kinds of campaigns to persuade the citizens have been done, and to recognize some best practices from there. The primary purpose of the benchmarking study is to find out and compare what has been done, what goals other cities have, and whether some best practices could be adapted to this work. The whole process is started by studying what others have done within the topic.

Affinity Diagram

Affinity diagram is a method for clustering the information. An affinity diagram can help gather large amounts of data and organize it into groups or themes based on their

relationships. The affinity process is useful for grouping data gathered during research. (Dam & Siang 2020.) The affinity process is used for mapping the low carbon acts as part of secondary research.

Co-creation

Co-creation is at the core of service design philosophy (Stickdorn & Schneider 2021). Co-creation activities vary from evaluating existing solutions to creating new ones. In co-creation, designers seek knowledge from users and aspire to understand the context of the project. Allowing the users to play an active role in designing establishes a setting for creative thinking and empathy. Designers seldom create services for people like themselves. Empathy is developed through activities such as roleplaying, interviews, and observation. (Lupton 2017.)

The intention is to create prototypes on people living a 1,5-degree life in Turku. Co-creation with the target audience already at the beginning of the process is experienced essential part of data gathering. The features as well as the amount of the personas is created together in the workshop. No one knows the people in Turku better than the people in Turku themselves.

Workshop and Semi-structured interviews

The purpose of a workshop is usually to combine a group of people with various backgrounds to co-create a solution to a common problem. The structure of the workshop can be described as service periods and can be divided to plan and prepare (pre-service) - Workshop (during the service) - Follow-up, and actions (post-service). The workshop itself is the service period, the planning and preparing is the pre-service period, and the work after the workshop is the post-service period. (Chambers 2013.)

In general, all frameworks for hosting a workshop follow a similar path. First, the ideas are collected to the defined problem with optional brainstorming methods, ideas are chosen with different voting methods, solutions are created for the problem from the collected ideas, and eventually, the organization commits to proceeding with the execution of the solution. (Courtney, 2020.)

In this case, the workshop is organized for creating the personas for the 1,5-Degree Life campaign. Tools for the workshop are an empathy map, a scenario map, a mindmap about life in Turku, and brainstorming. The structure of the workshop is described in chapter 3.1 Develop.

As some target audience groups are not present in the workshops, the data is supplemented by semi-structured interviews. A semi-structured interview gives guidelines for the interview yet without excessively curtailing the discussion (Stickdorn, Hormess, Lawrence & Schneider 2018, 24-26).

Empathy Map

Empathy map is a tool for visualizing user attitudes and behaviors, that helps to understand the user. The mapping process may also reveal holes in existing user data. It is used to articulate the things that are known about a particular type of user. It externalizes knowledge about users to create a shared understanding of user needs and aid in decision making. (Gibbons 2018.)

Creating an effective solution requires understanding the actual problem and the user's personal experience. An empathy map is most useful when used at the beginning of the design process after user research but before requirements and concepting. Synthesizing the research observations and revealing more profound insights into a user's needs is facilitated with the mapping process. It can help guide the construction of personas or serve as a bridge between personas and concept deliverables. Creating the map helps participants consider things from the user's perspective along with their goals and challenges. (Brown 2018.)

The intention is that the topics in the empathy map would encourage participants to think about their topic-related attitudes and thoughts deeper. An empathy map is used in the first workshop and group interviews and the scenario map in the second workshop. Approaches are similar, but the empathy map evoke deeper thinking of the attitudes.

Scenario Map

Scenario Map is a tool for building a better understanding of users' everyday experiences. It also helps to document collective understanding of situations and is best used as precursors to exploring new ideas or finding the right problem to solve. A scenario map includes four labeled rows: Phases, Doing, Thinking, and Feeling. (IBM n.d.)

Brainstorming

Brainstorming is a group exercise used to generate several ideas in a short period. The idea is to be non-judgemental and aim for quantity instead of quality. The ideas are curated afterward. (Stickdorn, Hormess, Lawrence & Schneider 2018, 86-87.)

The workshop aims to brainstorm features for each persona in housing, transportation, food, and consumption based on participants' own experiences or assumptions.

Personas

Understanding customers and users are one of the core principles in user-centric design. Creating personas or customer profiles is an effective tool for understanding and empathizing with the customer segment and user group more in-depth and creating more user-driven services. Customer profile summarizes the gathered research findings and motifs, values, fears, and hindrances of a target group to a description that facilitates understanding tangibly of what is designed, to whom, and why. Understanding how the value is offered to the customer is the basis of providing excellent customer experiences. (Tuulaniemi 2011, 133-135.)

Customer profiles are based on findings from research. The profiles present a description of one or more groups pointed out from the research. Created profiles are used to serve as a ground for new solutions and services. (Tuulaniemi 2011, 133-135.) A good amount for creating profiles is approximately 3-7 to represent the leading target segments company-wide. An appropriate amount makes the profiles easy to remember and empathize with. (Stickdorn, Hormess, Lawrence & Schneider 2018, 51-54.)

Customer profiles can be used in prototyping as the profiling is based on several models of building value. A designer creates optional concepts, and the potential value can be measured critically with the help of the consumer profiles before entering the market. As the strongest behavioral patterns guide customers' choices and values in relation to the offering, the hidden pattern can sometimes take over the behavior. When a designer understands different behavioral patterns and the appreciations behind the behavior, a designer can offer customer experiences that serve both dominant and hidden patterns that speak to the customer and create meaningful loyalty for businesses. (Tuulaniemi 2011, 133-135.)

Customer profiles are used for ideation, decision-making as well as service concept creation. A designer can evaluate a new concept of service touchpoints with the help of a customer profile. For businesses, customer profiles make customer segmenting and finding the customer groups easier as the targeting and profiling of the offered service or product is facilitated. (Tuulaniemi 2011, 133-135.)

In this case, personas serve both as a tool for understanding the audience and as an output. The primary purpose of creating customer profiles, referred to as Personas, is to generate tangible examples for the audience to empathize with. Personas are research-

based, and the data is gathered through workshops, semi-structured interviews, netnography, benchmarking, and statistics of Turku. Creation process of the personas is presented in chapter 3, and the output – their stories are in the appendices 11-16.

Value Proposition Canvas

Value Proposition Canvas is intended for the development of customer-friendly products or services. The focus is on the customer's expectations. The Value Proposition Canvas helps figure out what brings extra value for the customer and what the customer finds annoying or disadvantageous. (Design a Better Business 2017.)

In the canvas, the left side is for the proposition and the right side for the customer. Matching the value proposition and the customer profile can be evaluated by mapping the left side to the right side. Value proposition canvas enables an explicit description of how the value is created for the customers. When the offering correlates to the customer's fears and needs, the service in question offers value. If the two parts do not match, there is a risk that there is no value created. The value proposition is only worth something when it solves customers' problems. (Design a Better Business 2017.)

After framing the personas, value proposition canvases are composed between each persona and the 1,5-Degree Life campaign to estimate how the campaign could create value for the personas. By mapping the value proposition canvas, key features of the persona's minds and values can be identified, and the canvas serves as a visual tool to get to know the personas more in-depth before writing their stories.

Emotional Journey Map

Emotional journey map describes the feelings that series of events inspire. The series of events can be named the plot of the story. Stories have highs and lows, and the story's tempo varies in relation to the energy a person has. The emotional journey can also be used to describe a person's relationship with a product or service. Touchpoints describe curiosity, satisfaction, frustration, anger, and all other emotions. Roughly, usually, a plot can be mapped as a line moving up and down between misery and ecstasy. (Lupton 2017, 72-81.)

Emotional Journey maps are used to sketch the stories. Each persona's emotional journey is mapped about a pre-selected event that acts as a background plot in a story. The event will then be frosted with as many low-carbon acts as is relevant.

Feedback Survey

After finishing the stories, a survey for feedback is sent to a sample audience. A survey is a research method for collecting data (QuestionPro n.d). In this case, an online survey is sent together with stories to the sample audience. The intention is to test stories' impact on the reader and to collect feedback for improvements.

Coding

Coding is a method for the analytical work of qualitative research data. A code assigns an attribution for a portion of qualitative data that helps to recognize repetitive patterns or similarities to explain the phenomena under examination. The method is suitable, for instance, analyzing interview data or summarising a large amount of text. Different color codes also provide a visual tool to see the dominating attributes quickly. (What is a Code?: Qualitative Research Methods 2016.) In this case, coding is used to analyze the feedback survey responses.

Wordcloud

Word cloud is a tool for visually analyzing a certain amount of data. Word cloud generates a representation of words with greater prominence to words that appear more frequently. Visualization can help highlight the most common answers. (Mentimeter n.d.) Word cloud is used for a visual overview of the survey question responses.

2 THEORETICAL FRAMEWORK

The following chapter presents the findings from the secondary research. The conclusions of the research analysis are in Chapter 4.

The context of this Master's Thesis links to global warming. Also, to gain a deeper understanding, it is essential to recognize the principal guidelines and policies that regulate climate work globally and nationally. National policies, the Paris Agreement, and the Intergovernmental Panel on Climate Change (IPCC) are introduced.

Also, more profound research is done related to the 1,5-degree lifestyle and its requirements. Although, most of the work is in the societal structures, yet there are still ways to participate for consumers. Therefore, this Thesis only examines the participation of the consumers in achieving the goals of the Paris Agreement and does not take any stand on what kind of structural changes should be made.

Changes in consumption patterns have started to deserve more attention in discussions about the effect of lifestyles in limiting global warming. The approach of behavioral economics and nudging is closely related to consumption patterns. The theoretical framework analyzes the choice architecture and behavioral economics and nudging on consumer behavior, and its possibilities in guidance of the consumers' actions to more climate-friendly direction.

Eventually, as the concept intends to provide climate communication material in the form of a story and share information for the residents, the concepts of information design and storytelling are examined.

2.1 Climate Change

Understanding climate change and the relevant climate acts are the critical background information and starting point for further research on limiting global warming and provides the basis for the research aiming to respond to research question 1. *What choices can a consumer make to live 1,5-degree life?*

Climate change results from an increase in greenhouse gas carbon dioxide (CO₂) in the atmosphere caused by human activities such as burning fossil fuels, cutting down forests, and farming livestock (European Commission n.d.). Emissions are primarily caused by the use of fossil fuels and agriculture. Other greenhouse gases naturally present in the atmosphere are water vapor (H₂O), methane (CH₄), nitrous oxide (N₂O), and ozone (O₃). Nitrogen and oxygen do not cause the greenhouse effect. Assessment

of the changes in climate-related variables based on measurements has been possible since the mid-19th century. (Ilmasto-opas.fi 2017.) From the greenhouse gases, CO₂ is the most significant contributor to global warming. By 2020, the level of CO₂ has risen 48% above its pre-industrial level. (European Commission n.d.)

According to the latest data, the climate has warmed by 1,1°C since 1880 (IPCC 2021, 5-15). Currently, the average temperature is increasing at a rate of 0,2°C per decade. An estimate of an increase of 2°C compared to pre-industrial times would have severe negative impacts on the environment and human health and wellbeing. For this reason, the international community has recognized the need to mitigate warming well below 2°C and pursue to limit the warming to 1,5°C. (European Commission n.d.)

Impacts of climate change are already seen all over the globe. Most of the increase in temperature has occurred since the 1960s. The average global temperature has risen by around 0,12 degrees over a decade, and the growth rate in the Northern Polar Regions has been almost twice as fast as the earth's average. (Ilmasto-opas.fi 2017.)

The mass of continental glaciers in both Greenland and Antarctica has decreased at an accelerating rate over the last twenty years. The rate of melting of mountain glaciers has also accelerated in recent decades. In the northern areas covered with permafrost, the temperature of the earth's surface layers has risen by up to 2–3°C in some places since the early 1980s. In northern Russia, the area covered with permafrost has shrunk, and the frost layers have become thinner. In the northern hemisphere, the extent of snow cover on land has also decreased. (Ilmasto-opas.fi 2017.)

The top layers of the oceans up to a depth of 700 m have warmed over the last forty years. The surface layer of water extending from the surface to a depth of 75 meters has warmed most, with an average temperature increase of 0,11 degrees per decade which equals almost half a degree in total. The sea level has also risen and acidified because of global warming. As a result, rainfalls have become more common in northern land areas, while in areas such as the Mediterranean and southern Africa, it rains less frequently. (Ilmasto-opas.fi 2017.)

Such climate changes will increase and become more frequent and severe. Climate change will impact the food production and migration caused by uninhabitable changes in some areas. Damage to property and infrastructure, and human health imposes high costs on societies and economies. In addition, many plant and animal species are struggling to survive. (European Commission n.d.)

2.2 Climate Policies

Climate change is one of the most significant environmental problems affecting humanity. Climate change links to the global adequacy of natural resources, the loss of biodiversity, and unsustainable consumption and production methods. International targets oblige Finland to curb global warming. However, actions require participation from all parties, the state, municipalities, businesses, and citizens. Cities and municipalities have a pivotal role in mitigating climate change and supporting businesses and residents in the region to participate the climate work. (hiilineutraalisuomi.fi 2020.) Both national and international targets have been set to mitigate climate change.

Finland's climate policy

The EU's current climate policy aims to reduce greenhouse gas emissions by at least 40% by 2030 compared to 1990. In spring 2021, a European Climate Act reached the agreement, which will make the carbon neutrality target by 2050 and the 2030 emissions reduction target at least 55% legally binding. Negotiations on the proposals for directives intended to begin between Parliament, the Commission, and the Member States in autumn 2021. (Ministry of Environment, Euroopan unionin ilmastopoliitikka n.d.)

EU's tightening targets also tighten Finland's national targets. In addition to national targets, municipalities, counties, and organizations have set their own. A cornerstone of Finland's climate policy is the National Climate Act, which entered into force on the 1st of June 2015. According to the Act, Finland must reduce its greenhouse gas emissions by at least 80% by 2050 compared to 1990. In addition, the Act provides for a climate policy planning system and monitoring the achievement of climate objectives. The planning system aims for Finland to achieve both its climate change mitigation and preparedness targets. In its Government Programme, the current government has set itself the goal of Finland being carbon neutral in 2035 and carbon-negative soon after. The Climate Act is currently being reformed so that the government's goal of carbon neutrality, which means the balance between emissions and sinks, will be achieved by 2035. The climate and energy strategy and the medium-term plan are also currently updated. (Ministry of Environment, Suomen kansallinen ilmastopoliitikka n.d.)

The medium-term climate plan also highlights the role of municipalities in climate work as cities are responsible for organizing services, environmental education, local planning, transport planning, and public transport. In addition, municipalities can contribute to climate policy objectives in the context of joint procurement. Cities can reduce their emissions, for example, by energy solutions for buildings and city-owned

heating plants or by supporting the residents and staff for climate-friendly practices. (hiilineutraalisuomi.fi 2020.)

The Paris Agreement

A globally and legally binding climate agreement was agreed on the 12th of December 2015 at the 21st meeting of the United Nations (UN) Framework Convention on Climate Change in Paris. The agreement complements the 1992 UN Framework Convention on Climate Change, and the commitments cover the period after 2020. At least 55 parties, which altogether account for at least 55% of global greenhouse gas emissions, were required to commit to Paris agreement to it to come into force. The EU ratified the agreement in October 2016, which exceeded the threshold, and the Paris Agreement entered into force on the 4th of November 2016. The agreement was approved in Finland on the 14th of November 2016. (Ministry of Environment, Pariisin ilmastosopimus n.d.)

The goal of the Paris Climate Agreement is to limit global warming to well below 2°C, compared to pre-industrial levels, and to limit global warming to less than 1.5 degrees. The agreement also aims to reach global peaking of greenhouse gas emissions as soon as possible to achieve a climate-neutral world by mid-century. In addition to the emission reduction targets, the agreement sets a long-term goal for adaptation to climate change and matching financial flows towards low-carbon and climate-sustainable development. (Ministry of Environment, Pariisin ilmastosopimus n.d.)

The progress of the parties in relation to the agreement's objective is reviewed every five years. The parties are obligated to prepare a national contribution every five years, and the latest national target should always be more ambitious than the previous. To achieve the goal, all parties are expected to make efforts to reduce emissions, adapt to climate change, increase climate finance, develop, and transfer technology, strengthen operational capacity, and increase transparency. The Paris Agreement does not contain obligations for emission reduction, but the parties prepare, inform, maintain, and achieve their consecutive national emission targets. (Ministry of Environment, Pariisin ilmastosopimus n.d.)

Intergovernmental Panel on Climate Change (IPCC)

Another significant actor in climate politics is the Intergovernmental Panel on Climate Change (IPCC). The IPCC is the United Nations body to evaluate science related to climate change. The IPCC was established to provide regular scientific assessments to policymakers about climate change, its impacts, and potential future risks, and present adaptation and mitigation options. IPCC comprehensive assessment reports play an

active role in international climate negotiations. The IPCC does not conduct research, measurements, or monitoring itself but compiles published and reviewed scientific research data on climate change. (IPCC n.d.)

The IPCC has highlighted in its special reports the need for rapid changes in all areas to reduce greenhouse gas emissions significantly. In addition to emission reductions, limiting climate change requires a reduction in CO₂ from the atmosphere with the aim of net-zero emissions, which means that CO₂ emissions caused by human activities are equal to what human activities can remove from the atmosphere. (IPCC 2021.)

Natural carbon sinks, such as forests, oceans, and soil, bind CO₂. A carbon sink is a system that absorbs more carbon than it emits. It is estimated that natural sinks annually remove 9,5-11 Gigatonnes (Gt) of CO₂ when in 2019, annual global CO₂ emissions reached 38,0 Gt. In addition to insufficient capacity, natural carbon sinks release the stored carbon, for instance, in forest fires and changes in land use. To date, no artificial carbon sinks can remove the carbon from the atmosphere on the required scale. Reducing carbon emissions to reach climate neutrality is crucial. (European Parliament, 2021.)

Although the significant impact of behavior, lifestyles, and consumption patterns on climate change has been recognized, consumption patterns have traditionally been given little attention in climate change mitigation. The majority of policy measures to address climate change have focused on technology-related applications. (Lettenmeier, Akenji, Toivio, Koide & Amellina 2019.) Human activity has caused almost entirely the global average temperature rise by 1,1°C degrees. As illustrated in Figure 6., the level of 1,5°C degrees warming will be achieved in the early 2030s, in all scenarios, and 3°C degrees by 2100, based on emission reduction plans decided so far by all countries (IPCC 2021; Ilmatieteenlaitos, 2021.)

Delaying emission reduction measures can increase losses and costs and drive nations to resort to technological solutions with significant risks (IPCC 2018, 22). For example, technical removal solutions for carbon sequestration can have side effects related to the availability and quality of water and food production (Ilmatieteenlaitos, 2021). That is why it is even more essential to make lifestyles more sustainable. Behavioral and lifestyle changes and cultural and consumption-related changes can complement structural and technological changes that mitigate global warming. (Lettenmeier, Akenji, Toivio, Koide & Amellina 2019, 11-16.)

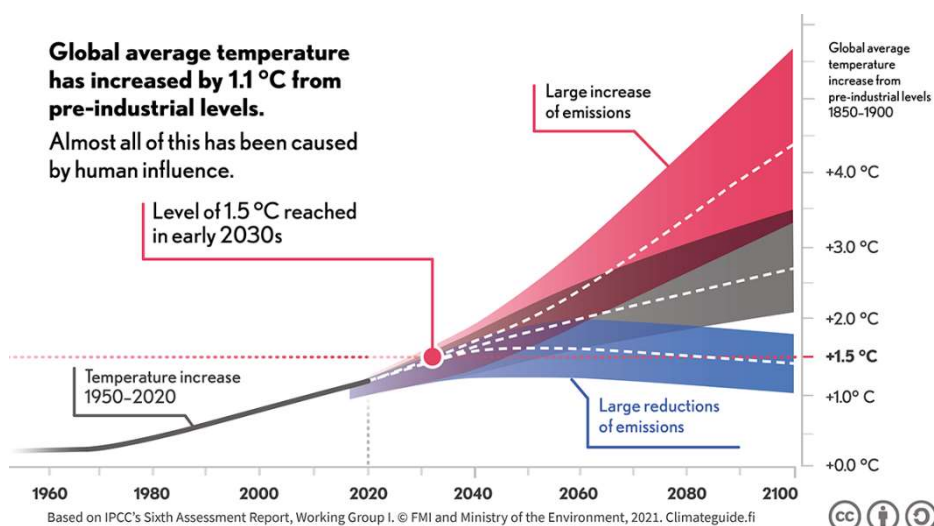


Figure 6. Estimated scenarios of global average temperature rise (Ilmasto-opas 2021; Ilmatieteenlaitos 2021).

2.3 1,5-degree lifestyle

The study regarding the 1,5-degree lifestyles provides solutions to the research aiming to respond to research question 1. *What choices can a consumer make to live 1,5-degree life?*

As mentioned, an individual's role in mitigating climate change has only recently been emphasized. Research findings on emission reduction pathways to achieve the 1,5°C targets were limited until IPCC prepared its special report on the 1,5°C target and related emission reduction pathways. In its Special Report (IPCC 2018) of October 2018, the IPCC focused on the impacts of global warming of 1.5 °C and related global greenhouse gas emission pathways related to limiting warming. The slower emissions are reduced now, the more and faster they need to be reduced in the future so that the carbon budget is not exceeded. Studies on the effects of climate change show that the 2°C warming target may not be able to counter the risks of extreme weather conditions that threaten the existence of vulnerable ecosystems. Given the risks, the global community was urged to be more ambitious and aim for less than 1,5°C. (Lettenmeier, Akenji, Toivio, Koide & Amellina 2019, 13-17.)

Lifestyle changes can produce results relatively quickly, especially in areas of consumption that are not tied to existing infrastructure and are easier to implement mainly by devotion. For holidays, for instance, people can decide where and how they are traveling when the transport options for commuting may be restricted by the location

and infrastructure of the residential area. (Lettenmeier, Akenji, Toivio, Koide & Amellina 2019, 11.)

Consumer's carbon footprint compounds mainly from nutrition, housing, mobility, consumer goods, leisure, and services. By targeting the actions to such domains, households can drastically diminish their greenhouse gas emissions, for example, by optimizing energy consumption or reducing privately owned cars. (IGES, Aalto University & D-mat ltd 2019.)

The average carbon footprint of a Finn in 2019 was 10,3 tonnes of carbon dioxide equivalent. Carbon dioxide equivalent (CO₂e) considers not only CO₂ emissions but also other significant greenhouse gas emissions, notably methane (CH₄) and nitrous oxide (N₂O). For example, one ton of methane has a climate impact of 25 tonnes of carbon dioxide. (Lounasheimo, Cederlöf, & Mäntylä 2021.) Distribution of emissions between the four domains can be seen in Figure 7.

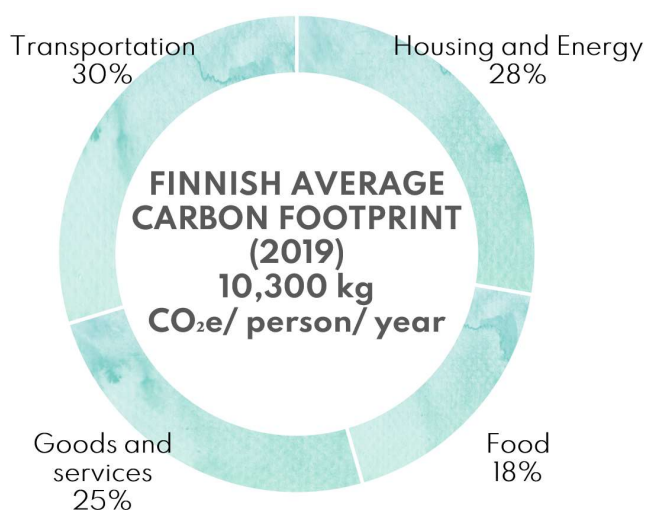


Figure 7. Finnish carbon footprint (Lounasheimo, Cederlöf, & Mäntylä 2021, 6).

The current carbon footprint is far from the estimated sustainable consumption, which is globally only 2,5 tonnes CO₂e/person/year. In the medium- and long-term climate policy plan, Finns are encouraged to cut their carbon footprint to half by 2030. The climate panel estimates that the carbon footprint of households should be reduced by as much as 70% for Finland to achieve its goals. (Lounasheimo, Cederlöf & Mäntylä 2021, 79-80.)

Technical Report of 1,5-degree lifestyles (IGES, Aalto University & D-mat ltd 2019, 25) estimates lifestyle carbon footprints based on consumption and the carbon intensity of the items. Carbon intensity refers to the company's greenhouse gas emissions in relation

to turnover (tCO₂/€) (Sitra, Tulevaisuussanasto n.d.). The report suggests three main approaches that consumers have for reducing their emissions:

Absolute reduction means reducing physical amounts of goods or services consumed. However, expenditure is not necessarily reduced. Such goods are, for instance, food, driven kilometers, energy use, or living space, as well as avoiding unsustainable options.

Efficiency improvement means decreasing emissions by replacing technologies with lower-carbon technologies. However, the amount consumed or used, for instance, in energy-efficient agriculture, vehicles, or housing, remains the same.

The modal shift means changing from one consumption mode to a less carbon-intensive one. Modal shift can include switching to plant-based diets, using public transport, or renewable energy for electricity or heating.

Circular Economy

Many of the 1,5-degree life acts follow the circular economy principles, and eventually, without the circular economy, the goals of the Paris Agreement will be difficult to attain (WCEF+Climate 2021).

A circular economy refers to an economic model based on committing to preserve the value of materials in society for as long as possible. Economic growth is independent of resource consumption, and instead of producing and buying more, consumption is based on sharing, renting, and recycling by offered services. (Sitra n.d.)

The circular economy has appeared in academic discussion since late 1970, but it has turned more mainstream in the 2010s. EU has been building the implementation of circular economy actions since 2015, and it has been leading the way to a circular economy at the global level. (Ellen MacArthur Foundation n.d.; The European Commission 2020.) Sitra (the Finnish Innovation Fund) has been promoting the circular economy actions in Finland and offers a good source of information and tools for implementing the circular economy actions in practice.

As the consumption models are crucial in the circular economy, moving towards a circular economy offers plenty of ways to change the consumption patterns of individuals and entire households towards a 1,5-degree lifestyle.

In addition to consumers, the transition towards the circular economy requires an attitudinal and functional change from the private and public sectors. User-centredness and new kinds of companionship ecosystems are necessary. Sharing, leasing, renting, repair and refurbishment, reuse, recycling, and product design aimed at minimizing

waste as well as designing services are examples of the circular economy operating models. (Ellen MacArthur Foundation n.d.)

Business models may create value by offering services instead of products. This type of business will eventually change the culture of owning when companies offer functionality. Product ownership, as well as the responsibility of the functionality, stays at the service provider. Products can be rented or leased. (Sitra, Kiertotalous n.d.)

Products are designed by following the principles of eco-design, which are modularity, ability to reassembly, and recycling. In addition, products are manufactured from renewable and biodegradable materials, and renewable energy is used instead of fossil fuels in manufacturing processes. Finally, digitization enables the resource efficiency and wiser use of products by digital sharing platforms where products can be either sold, rented, leased, or donated. (Sitra, Kiertotalous, n.d.)

Products are intended to be kept in use as long as possible by design. Product lifecycle can be lengthened by modularity, and products can be repaired and maintained as well as updated. Product lifecycle and resource efficiency can also be covered by sharing and co-usage. Value is created by environmental and economic benefits as well as by the efficient use of resources and recycling. Industrial side flows and waste as a resource are capitalized in other manufacturing processes, and the waste formation is avoided. Companies can either be manufacturers or offer recycling or collection services as a business model. End of life- operations are also every day. (Sitra, Kiertotalous n.d.)

The research has shown several examples of lifestyle changes for a consumer to reduce emissions in practice. Examples of low-carbon everyday acts are mapped in an affinity diagram. The affinity diagram is presented in Figure 8. Also, a bigger image is in Appendix 1. The original sources offer more profound information regarding the precise CO₂ emission reductions of each act. For further information, it is recommended to visit the original sources to find out how much one can reduce the carbon footprint by adopting the act. For instance, it is explained how and why adopting a challenge such as Lihaton lokakuu (Meat-free October) helps to reduce the carbon footprint by one percent a year. The database offers similar data for over 100 low-carbon acts and the size of an impact of the act. (Sitra, 100 fiksua arjen tekoa n.d.).



Figure 8. Affinity diagram – Climate acts (Sitra, 100 fiksua arjen tekoa n.d.; Susla n.d.; Motiva n.d.).

2.4 Behavioral Economics and Nudging

The City of Turku is aiming for carbon neutrality by 2029. 1,5-Degree Life campaign is a call to action for residents to participate in climate work. The campaign offers information and activates and inspires the city's residents. Still, the essential question is how to motivate people to change their behavior eventually? An analysis of literature related to behavioral economics aims to clarify and provide answers and theoretical solutions to the research question 2. *Can consumer behavior and decision-making be motivated by nudging, and how can nudging be utilized in promoting a climate-friendly lifestyle?* The outcome presented later in this thesis aims to motivate people to adopt new acts to everyday life and nudge towards a more environmentally sustainable lifestyle.

Behavioral economics is a study of psychology that draws aspects from both psychology and the economy. Behavioral economic studies the behavior, especially the decision-making processes behind the behavior. Choice architecture applies behavioral economics research in practice. Choice architecture aims to influence the human decision-making environment and change in behavior. The choice architect can significantly impact customer satisfaction by, for instance, designing user-friendly environments. (Thaler & Sunstein 2009, 11.)

Nudging, in turn, is a sub-concept of choice architecture. Nudging aims to influence the behavior and decision-making of groups and individuals by gently and indirectly pushing the audience to the wanted direction yet without declining any options or significantly changing their economic incentives. (Thaler & Sunstein 2009, 8.) According to Daniel Kahneman, Nobel prize-winning psychologist, the definition of a nudge refers to the subtle guidance of behavior and choices that people make without curtailing their freedom to choose (Kahneman 2012, 412-413).

A nudge is something that gently pushes someone to make such decisions that improve health, wealth, and happiness. As an example, a nudge can be a fruit placed at eye level instead of candy bars or appealing stairs in subway stations that encourage walking the stairs instead of using the escalators. A nudge must be easily recognized and explained, and it must base on free will instead of a mandate. Nudging is widely used in both public and private sectors, and in general, ethics is essentially related to the subject. The million-dollar question is who decides what improves health, wealth, or happiness as experiencing is subjective. (Thaler & Sunstein 2009, 6-7.)

Human behavior is irrational yet predictable. Decision-making is affected by commonly recognized biases, such as people's tendency to act as others do or anchor their thinking to random initial information. A bias is a systematic judgment error that results in predictable error assessments. For example, based on previous purchases, everyone has formed an idea of the price of a new pair of trousers. The price creates an anchor that guides the behavior when buying the next pair. The tendency to act as others do is lead by the herd instinct. As an example, there are two restaurants close to each other. There is a queue in front of the other while the other one is empty. People are more likely to assume that the one with the queue is better. The queue also makes choosing the restaurant more socially appealing and approved. (Ariely 2009; Thaler & Sunstein 2009)

According to Kahneman, thinking is the process of two systems, System 1, and System 2. System 1 operates automatically and quickly, with little or no effort and no sense of voluntary control, when System 2 allocates attention to the mental activities that require effort. System 2 is slower in information processing and acts consciously. For example, system 1 detects that one object is more distant than the other or answers question $2+2$. System 2, in turn, searches memory to identify a sound or makes comparisons of products for overall value, to mention a few. (Kahneman 2012, 20-24.)

Narrowing the gap between the intention and reality and influencing behavior can be affected in different ways. It can be done by education, incentives, laws, and regulations, or by choice architecture and nudging. (Thaler & Sunstein 2009.) An example of an

incentive that could promote 1,5-degree life could be, for instance, removing the VAT from plant-based groceries. That could lead to increased consumption of plant-based products without affecting the circumstances of meat products. However, such incentives cannot be called as nudges as the core principle in nudging is that economic incentives cannot be applied, only change in behavior (Thaler & Sunstein 2009).

By nature, people seem to be prone to nudges. According to Dan Ariely (2009, 55-75, 119-139), people tend to procrastinate by nature, overvalue their owning, and obey the herd instinct and social influences. All these biases make the behavior sensitive to nudges, and nudging may gently assist people's decision-making. For example, setting strict deadlines may reduce the overload of a procrastinating student at the end of a semester, or making recycling of old goods particularly easy could increase the willingness to recycle, even for those for whom the emotional value of the goods is emphasized. People tend to go to the restaurant where the queue is. However, the herd has not adopted low carbon acts as social norms yet. Most still envy long-distance traveling rather than judge carbon emissions.

Nudges have been used to pursue behavior that is generally known to be good. Global warming is one of the biggest threats in the current world. Based on these two arguments, the use of nudges when promoting climate-friendly acts is fairly judged. And it has been widely used already. For instance, placing the information about the product's carbon footprint may nudge the consumer to choose the one with a lower carbon footprint. Also, different applications to measure energy savings nudge people to energy efficiency. (Thaler & Sunstein 2009, 257-261.)

Rebound Effect

There is a risk of rebound effect when introducing energy-efficient products or environmentally friendly behavior. The rebound effect happens when the solution to a problem reduces the benefits or worsens the situation. A consumption-reducing solution may increase resource use and environmental impact. In that case, there is a risk that the benefits of reduced consumption, such as resource and energy savings, would be lost instead of ecological sustainability. For example, buying a low emission car may increase the amount of driving and eventually transportation emissions. Thus, simply focusing on resource- and eco-efficiency may not promote emission savings. Also, technological innovations can lead to cost and resource savings in production, making products cheaper. This, in turn, can lead to higher total production and increased demand and consumption. (IGES, Aalto University & D-mat Ltd 2019; Sitra, Tulevaisuussanasto n.d.)

One aspect where the nudges could be beneficial is the rebound effect. The rebound effect is a pitfall in the success of decreasing an individual's carbon footprint. In situations where the risk of the rebound effect is relevant, nudging might help to consider the side effects. According to Thaler and Sunstein (2009, 78-80), people might most need a nudge for choices with delayed effects and infrequent and difficult choices where the feedback and relation between choice and experience are seen as ambiguous. So basically, nudging is needed in all aspects of low carbon activities as the entity is extremely difficult, the effect is delayed, and the feedback and relation between the choice and experience are vague.

Nudging away the climate change

In addition to facts and figures, climate change evokes emotions; for example, climate anxiety is an identified phenomenon (Autere 2019). In addition to motivation, emotions link the topic to human psychology. As only the technological or political approaches seem not to be sufficient, behavioral economics might help. According to a survey by Sitra, a sustainable lifestyle is perceived as the most effective remedy for managing anxiety and other challenging emotions that climate change causes (Autere 2019).

The article *Nudging us away from climate change: Using behavioral science to help reduce emissions* (Jenkings 2019) addresses that even if people are aware and understand the science of climate change, their behavior is still not responding. According to Jenkins, "climate change is not just a debate that calls for more facts and information to feed the slow, conscious, and deliberate reasoning 'System 2' thinking. It is also a challenge in which our thinking is dominated by predictable mental biases and fast, automatic responses — 'System 1' thinking." (Jenkings 2019.)

Systems 1 thinking could be nudged to energy efficiency simply by transforming low-carbonity into a social norm, describing more appealing vision instead of horror, and, as mentioned, by applications to measure energy savings, for example, by giving feedback.

Motivation

To investigate and illustrate the motives behind smart consumption, Sitra created seven motivation profiles of smart consumption. In this context, smart consumption refers to considering individual needs, the earth's carrying capacity, and the adequacy of resources when purchasing goods and services. (Huumo, Kaitosalmi, Tuomisto, Kavenius & Tikkanen 2019, 7-10.) Profiles are presented in Table 1.

Table 1. Summary of Motivation Profiles (Huumo, Kaitosalmi, Tuomisto, Kavenius, & Tikkanen 2019).

	Demographically typical profile representative	Factors that motivate smart consumers
COMFORT-SEEKING HEDONIST	Economically well-to-do male living in a city or suburb together with a spouse.	<ul style="list-style-type: none"> - Comfort and pleasure, - Making life easier - Buying new things - Quality - Luxury - New experiences
TRIBAL FOLLOWER	Young adults who have recently moved out of their parents' home or who still live with their parents. Live in a large city or a suburb of it.	<ul style="list-style-type: none"> - An easy life - A sense of belonging to a group - Examples set by other people - Social media - Cost-effectiveness - Enjoyment or benefit that can be directly seen in one's own life - Easiness (easy to adopt and understand, easy to try out)
DAY-TO-DAY SURVIVOR	Economically less well-off middle-aged male or female living in a city or the countryside	<ul style="list-style-type: none"> - Basic needs - Saving money at the point of consumption - Effortlessness - Low cost (compared to other adjacent products) - Hope for something better
IMPULSE BUYER	A fairly young or middle-aged woman with a busy life. Lives in a large city or a suburb of it.	<ul style="list-style-type: none"> - Joy of discovery at the moment of purchase - Beautiful shop displays and marketing messages - Bringing joy to daily life - Making daily life easier - Low cost and discounts - Easy to try out
TRADITIONAL VOICE OF REASON	A man over 60 living together with a spouse in a smaller town or in the countryside.	<ul style="list-style-type: none"> - Domestic and local production - Higher-quality, durable goods - Feeling of making a sensible choice - Well-being of family and immediate environment - Reputation and tradition - Benefits that can be easily seen in everyday life
TREND-SETTING FEEL-GOOD GREEN	A young adult living in the greater Helsinki region or another large urban area.	<ul style="list-style-type: none"> - Opportunity to serve as an example to others - Good design, quality and durability - Individuality, personal look, style and identity - The joy of finding the perfect product - Green values, environmental friendliness
RESOURCEFUL ECO-WARRIOR	An economically comfortable, well-educated woman over 50, living with her spouse.	<ul style="list-style-type: none"> - Reducing consumption - Environmental friendliness and responsibility - Minimising waste - Domestic and local production - Quality and durability - The feeling that one has done the right thing - Values and conscience strongly connected to choices

The earth's carrying capacity is only one motivational factor among others. Each profile is motivated by its own anomalous factors. Resource wisdom can also happen due to economic motivations and in such cases, resource wisdom is often unconscious. According to the study, Finns are not yet very accustomed to using services aimed at smart consumption or thinking about everyday choices to the earth's carrying capacity.

However, there seems to be interest in the topic. (Huumo, Kaitosalmi, Tuomisto, Kavenius, & Tikkanen 2019, 42.)

The study divides Finns into seven motivational profiles, according to what motivates them as a consumer. Decision-making can be motivated by eco-friendliness and the earth's carrying capacity, while others make decisions to maximize their enjoyment or cheer themselves up. Describing features are divided according to whether consumption decisions are based on emotions and pleasure rather than facts and ratio. Also, whether the effects and benefits of one's choices are only directed at themselves and their loved ones, or whether they are perceived to have a more significant impact and purpose. (Huumo, Kaitosalmi, Tuomisto, Kavenius, & Tikkanen 2019, 7-10.)

As is already known, many consumer decisions are irrational. Decision-making is a complex, partly unconscious chain of thinking that, in addition to motivations, values, and attitudes, is affected by known biases such as anchoring and herd instinct. (Ariely 2009.) People's decision-making is influenced both by permanent values and by the conscious and unconscious motivational factors that arise in each everyday situation. They are often influenced not only by motivational factors but also by social norms. (Huumo, Kaitosalmi, Tuomisto, Kavenius, & Tikkanen 2019, 7-10.)

In this context, four good guidelines for service providers to nudge towards smarter consumption were identified. 1) Pointing fingers and blaming does not move anything forward. Learning away is hard, but the positive tone of voice may inspire experimenting and learning new things. 2) Instead of thinking that small actions would not count, a single act should be associated with a larger context and its relevance. 3) Change is often frightening and laborious and changing routine habits at once is distressing. All could be started step by step and every little move in the right direction would be granted with positive feedback. 4) Concrete instructions and guidelines help almost everyone, especially when the brain sometimes works on autopilot in everyday life situations. (Huumo, Kaitosalmi, Tuomisto, Kavenius, & Tikkanen 2019, 34.)

UK-based Sustainability Consultancy Agency Futerra offers a similar approach to “sell the sizzle instead of the sausage.” It is the sizzle that makes people desire the sausage. The key to motivating people to change their behavior is to offer them sizzle – heaven. (Futerra 2018.)

Nudging by making the possible effect seem appealing could serve as a to call to action. As, according to Futerra (2018), “Threats of climate hell haven’t seemed to hold us back from running headlong towards it.” The climate hell in the anecdote is the sausage.

In addition to facts and figures, the sizzling vision of low carbon heaven would make people pursue the target, not the vision of horror. Mitigating climate change is not just about giving up and misery. As stated in the 1,5-Degree Life campaign – “Climate-friendly life is not renunciation and misery, but at its best, it brings health and well-being to our lives and raises new business.” (Turku n.d.)

2.5 Information Design

This chapter aims to support research problem 2. *How to communicate the acts promoting 1,5-degree life?* The chapter provides the background knowledge for the creative process of the commission and helps to find the suitable communication method of the 1,5-degree lifestyle goals to the target audience.

Information design is the practice of presenting the information. The goal is to clarify the content by making the data most accessible and understandable for users by designing it to meet the defined objectives of target audiences in specific situations. Information design guides users' understanding of complex data by organizing and simplifying data and information to be quickly grasped. (SEGD 2014.)

The presentation method is designed as straightforward as possible so that the user can take advantage of it. Information design can include written text and table presentation, but primarily information design refers to data visualization. However, the aim is not just to transform the numbers into something exciting but transform the topic into visual form to provide new meanings. Not all communication is forwarding information. The communicational objective can be, for example, in values and mental images. Visualizing is often referred to both, describing the process where data is transferred to its visual form and the end result. (Koponen, Hildén & Vapaasalo 2016, 19-23; SEGD 2014.)

The end result of the visualization process is often divided into infographics and visualizations. Infographic is an explanatory graphic that is usually utilized to support communication and deliver existing information from one person. On the other hand, visualization is exploratory graphics revealing something new and is not just breaking news but finding further information. Visualization is not just delivering visuals to predefined details. The primary definition of visualization is to act as a tool by which the reader can find interesting new features from the material. Infographic tells the story when visualization is a tool by which a reader can find one's own story. The separating line is not as clear, and a graphic often has both explanatory and exploratory features. (Koponen, Hildén & Vapaasalo 2016, 20-21.)

According to Koponen, Hildén & Vapaasalo (2016, 25-29), there are two main principles of information design: comparing and reducing the content. A single value does not give any information to the reader if it cannot be compared to anything. Therefore, comparison and reading of the visualization are made more accessible when the irrelevant content is reduced from the picture. Thus, information design can improve understanding by creating a visual hierarchy that emphasizes the most critical content by comparing and reducing the content (SEGD 2014).

According to Koponen, Hildén & Vapaasalo (2016, 30-32), visualizing should be avoided if the content is easier to understand from the written text. Visualization gives the content a simple, precise, and permanent meaning by constructing and forming otherwise abstract and unconnected data points. The golden rule is that an information designer should choose how to present the data so that the output is as straightforward as possible and never disregard the information. In addition, aesthetic features should never pass over the clarity of the content.

Pictures have enormous power, and the reader usually remembers the image much better than the written text. Information should not just be decorated, but the visualization should aim to increase understanding. If a reader sees the misleading image with explanatory text, the reader will most likely remember the misleading image. (Koponen, Hildén & Vapaasalo 2016, 325.)

2.6 Storytelling

This chapter is aiming to support the research problem 2. *How to communicate the acts promoting 1,5-degree life?*, and has been used as a theoretical background and guidance while creating the short stories.

Storytelling has been a form of communication throughout time. Storytelling is present at all stages of our lives, and our worldview is largely perceived in the form of stories. (Rauhala & Vikström 2014.) For instance, the insights and ideas often separate from their original context in the corporate world and lose their resonance. However, when situated in narratives, ideas and insights may retain their relevance. It makes the context more tangible and makes complex data easier to understand. (Stickdorn & Schneider 2021, 202-203.)

In the entertainment industry, stories usually end so that the audience leaves with a restful mind. In the business world, the story does not end when the story ends. Instead, the story continues its life in the listener's actions and insights. Storytelling is generally used in companies and communities as a tool for marketing and communication as well

as for leadership and organizational culture, either orally or through various channels, and the story is suitable for any purpose, from fast pitching to the transmission of challenging information. (Rauhala & Vikström 2014.)

In general, the story is an actual or fictional plotted account of an event with a beginning, a middle, and an ending. The beginning and the end are somehow intertwined. The critical elements of the story are the starting point, events, goals, change, difficulties, and characters of the story. According to one definition, a story is a form of human communication in which the goal is to persuade the audience to adopt the storyteller's worldview. Storytellers utilize characters, real or fictional, describing what happens to them over a specific period. Each character has aspirations according to their values and they either succeed or fail depending on the storyteller's worldview. (Rauhala & Vikström 2014, 59-63.)

The metaphor allows the listener to be freed from the shackles of everyday thinking. Storytelling can be utilized, for example, when someone wants to provide new information or when someone wants to improve customer understanding. Whatever new is designed, it must always start from understanding the customer. Henry Ford is said to have commented on the importance of customer surveys as follows: " If I had asked the public what they wanted, they would have asked for faster horses." When customers are asked to describe their wishes in the form of a story, innovations like the mass production of cars might not be born, but the designer becomes aware of customers' values. Which, in turn, is essential for the development of innovations. (Rauhala & Vikström 2014, 59-68.)

The story makes it possible to share information in a way that interests even the unacquainted listener. The story might also bring the quiet information tangible, which is otherwise difficult to put into words. Only a tiny part of our thinking is conscious or analytical reflection. Thinking is driven by emotion. In the words of Daniel Kahneman: "if emotions and sense were to be made into a film, sense would play a side role thinking that it plays a major role " The stories have an impact on the unconscious side and emotions. Emotions, habits, and instincts guide the unconscious activity. The conscious side of the human mind – logic and rational thinking is just the tip of the iceberg. Logically justified facts may not reach the unconscious that the story reaches. (Rauhala & Vikström 2014, 59-68.)

The audience can relate to the story. The audience experiences empathy and compassion with the story. At its best, the story influences and changes attitudes and helps to remember presentations or facts better. The story gives context to facts and

things, which is essential for remembering. Getting emotional experience connects the story to more contexts and thus makes it easier to remember. Through stories, challenging entities can be popularized and made more accessible for the unacquainted to understand. The story softens the message, and the message can be told without saying it out loud. Compared to abstracts lists, a story is also an effective way to set out new policies and guidelines. The fact that also speaks in favour of storytelling is that the content of a message is most effectively remembered by the means used, not how good a performer someone is. (Rauhala & Vikström 2014, 71-90.)

The disadvantage is, that storytelling also allows manipulation and distortion of facts. Stories have been used as a propaganda tool precisely because of their impact, and the listener should never forget critical thinking. Brainwashing or demagoguery have consistently been implemented through stories. The listener has the right to identify fictional stories as untrue. (Rauhala & Vikström 2014, 99.)

The story's narrator defines a goal for his story. The story is successful if it works on the audience according to the goals. A good story causes the audience to change their actions and attitudes and continues living through those. The more the narrator knows the audience, the more the story can do. The audience identifies with the hero, the protagonist, or when he inspires empathy in the audience, the story's goal also comes close to the audience. If the narrator's choices and solutions match the listener's values, the story inspires and vice versa. (Rauhala & Vikström 2014, 137-165.)

The goal of the story passes through the plot and the protagonist. The final solution reveals the views and values of the storyteller. The hero's fate makes the listener decide whether they agree with the story and whether it influences the listener's way of acting or thinking. If the values go against the principles of the listener, the story can, at worst, offend the listener. (Rauhala & Vikström 2014, 137-165.)

3 CONTENT CREATION PROCESS FOR CLIMATE COMMUNICATION

This chapter describes the service design process and the practical application of selected research and service design methods and tools. According to the double diamond framework, the process is divided into four phases – discover, define, develop, and deliver. Each phase is separately reviewed.

3.1 Discover

The discover-phase started with a kick-off meeting with the commissioner on April 30th, 2021. In the meeting, the project was outlined, and the requirements and wishes from the commissioner's side were discussed. The initial division of responsibilities and first impressions were shared. It was agreed that the prototypes of Turku citizens would be co-created with real people. Also, preparatory research, including benchmarking and online ethnography, was started.

Findings from preliminary research

The whole process was started by benchmarking the climate programs of Helsinki, Espoo, Jyväskylä, Kuopio, Tampere, and Lahti, and neighboring European capitals Stockholm, Oslo, Copenhagen, and Tallinn. Approaches varied. Few things were common for all Finnish cities: a goal for climate neutrality and a direct link to the lifestyle test to calculate the individual carbon footprint. Also, the tips and practicalities shared by the cities were divided almost exceptionally between the domains of transportation, housing, food, and consumption. Only Kuopio had a different division between domains: Energy production and consumption, Mobility and urban structure, Agriculture and food, Consumption and material circulation, and Forestry and carbon sinks. Kuopio also had a program for Resource Wisdom.

Finish cities' typical goal for climate neutrality was 2030 with a few more ambitious exceptions: Turku 2029 and Lahti 2025. From the neighboring capitals, Oslo aims to reduce greenhouse gas emissions by 95 percent by 2030 (CNCA, Carbon Neutral Cities Alliance, n.d.), and Tallin targets for carbon neutrality by 2050 (Tallinn, 2021), Stockholm by 2040 (CNCA, n.d.) and Copenhagen aims to be the first carbon-neutral capital already in 2025 (CNCA, n.d.).

In addition to official targets, some cities had applied different approaches by using gamification such as tests and challenges to their residents. Tampere had created a

concept of Climate Hero (Ilmastosankari) together with Ekokumppanit, where everyone can participate and find their inner climate hero. The concept seemed to have a similar intention to encourage and nudge residents to participate as the commissioners 1,5-Degree Life campaign. Also, Helsinki had different initiatives for climate work for the inhabitants. Helsinki Climate Watch lists and tracks actions, MyHelsinki city strategy is for reaching the climate neutrality target and service Choose More Responsibly (Valitse Vastuullisemmin) for finding the responsible service providers in the area. Jyväskylä shared tips and practicalities for resource wisdom in collaboration with JAPA Ry, a non-profit association that promotes sustainable development in Jyväskylä.

The more appealing approaches were the ones that were entertaining and interactive, Helsinki and Tampere, for instance. When the aim is to inspire citizens to take action, the approach must also be fun and attractive.

Online ethnography included familiarizing with social media influencers and bloggers specialized in climate work. Nothing specific was included for the thesis work as such, but the hot topic and discussion around ICCP were orientated. Also, discussions from cities' climate forums in social media channels were monitored. Climate-related screening offered several good ideas for information sources and was valid.

Also, as the intention was to familiarize with the inner life of Turku citizens, Turku-related discussions were monitored in the discussion forums in suomi24.fi and vauva.fi. Discussion topics stating questions "What is best in Turku and in being from Turku from the senior/ family/ teenager/ student perspective?" and "What would you recommend in Turku?" were also started in the same forums. Turku-related output was trivial.

3.2 Define

The define phase was filled with desk research and a deeper understanding of the phenomena related to the topic under research. Eventually, based on the findings from desk research, an affinity diagram with several low-carbon consumer acts was mapped under the domains of housing, transportation, food, and consumption. The affinity diagram is presented in Figure 8. Affinity diagram – Climate acts. Also, a bigger image is in Appendix 1. The campaign intends to share tangible examples and tips to 1,5-degree life. For that reason, the information mapped in the affinity diagram formed the basis of the designed content. The affinity diagram was also part of the introduction of the workshop and helped the participants understand what kinds of acts the 1,5-Degree Life campaign is going to be about.

Also, simultaneously the co-creation plan was moving ahead. It was agreed that a workshop together with the citizens would be organized.

Findings from secondary research also supported the idea of combining climate change mitigation with nudging and storytelling. Literature analysis helped recognize the red thread throughout the process and themes of the thesis framework. The driving force in changing the behavior is often motivation, and the campaign intends to motivate people to change their behavior.

Findings from the Define phase

The ideation and organizing of the co-creation workshop were started. The starting point was to go through and gather relevant statistics of Turku. Statistics that were considered relevant are listed in Table 2.

Table 2 Statistics of Turku (Turku n.d.)

POPULATION (2019)	192 962
POPULATION (2019)	12,7% 0-14 years, 66,6% 15-64 years, 20,8% + 65 years
LANGUAGE (2019)	5,5% Swedish-speaking, 11,8% non-Finnish or Swedish
FOREIGN NATIONALS (2019)	6,7%
EDUCATION	those aged 15 and over: 23,5% primary education, 40,8% second-degree education, 0,7% specialized vocational education, 35,0% higher education
FAMILY SIZE (2018)	average 2,6 people, 28% single-parent families, 46,959 families
HOUSING (2018)	105,025 (average 1,76 people/household) 1-person households 53,1%, min. 5 people. 2,6%
AREA OF DWELLINGS	average/person 38,3m ² , 25,1% in detached houses, 73,5% in apartment buildings
UNIVERSITY STUDENTS (2018)	29,909

First, the range of personas was selected based on statistics. Initially, the population was planned to be covered by four personas:

- A teenager (single-parent-family, lives in an apartment building, second-degree student).
- A student (1-person household, lives in an apartment building).
- A parent (family, higher education, detached house).
- A senior (1-person household, lives in an apartment building).

Already from sketching, the intention was that personas would be illustrated and named so that no ethnic or language background would be underlined. Invariably, when thinking

about the prototypes, stereotyping is unfortunately extremely difficult to avoid. In this case, stereotyping was tried to be avoided so that some features were left intentionally open. That way, the reader can use own imagination and decide if the person is, for instance, Finnish or Swedish speaking, whether a couple is or was heterosexual or what the ethnic background of a person might be.

3.3 Develop

The date for the first workshop was agreed to be June 1st, 2021. The length of the workshop set its constraints, and it had to be planned and timed carefully. The length of the workshop was two hours. The workshop started with warming up. Selected tools for warming up were an empathy map, a scenario map, and a Turku mind map.

The intention was that filling the canvases discussion-based together in the beginning, would help participants adjust their thinking to the topic and practice the use of Miro platform. Empty warm-up-workboards used in the workshop are presented in Figures 9-11.

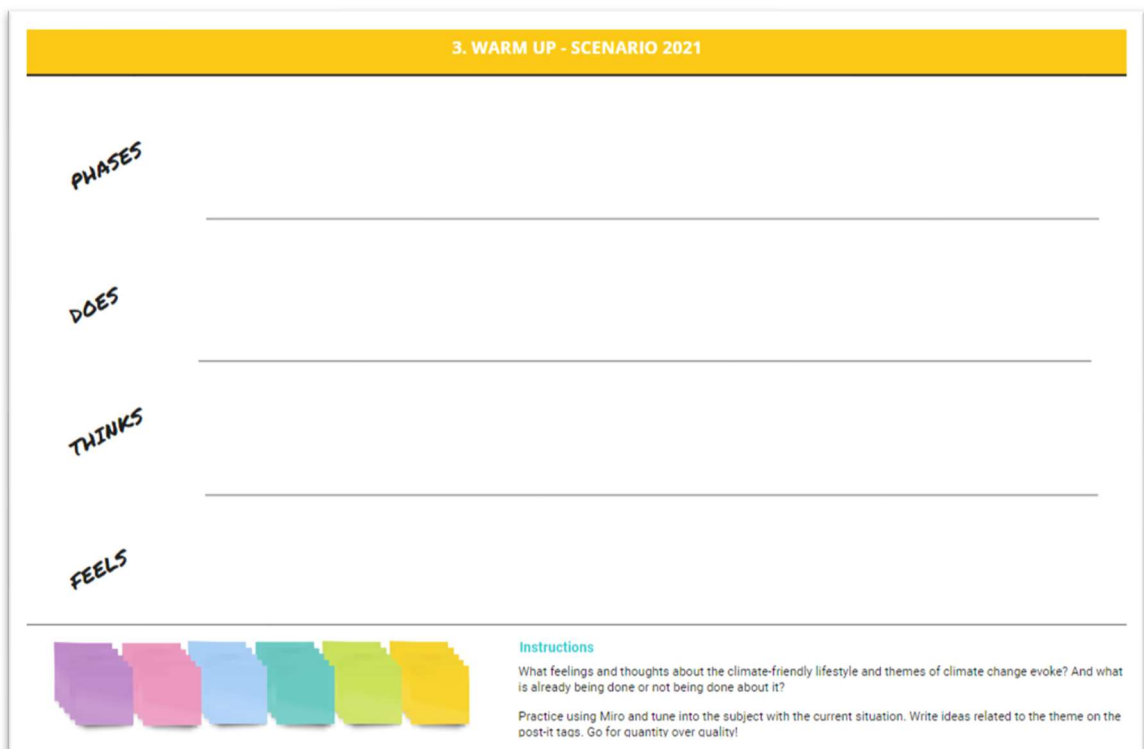


Figure 9. Empty Scenario Map canvas

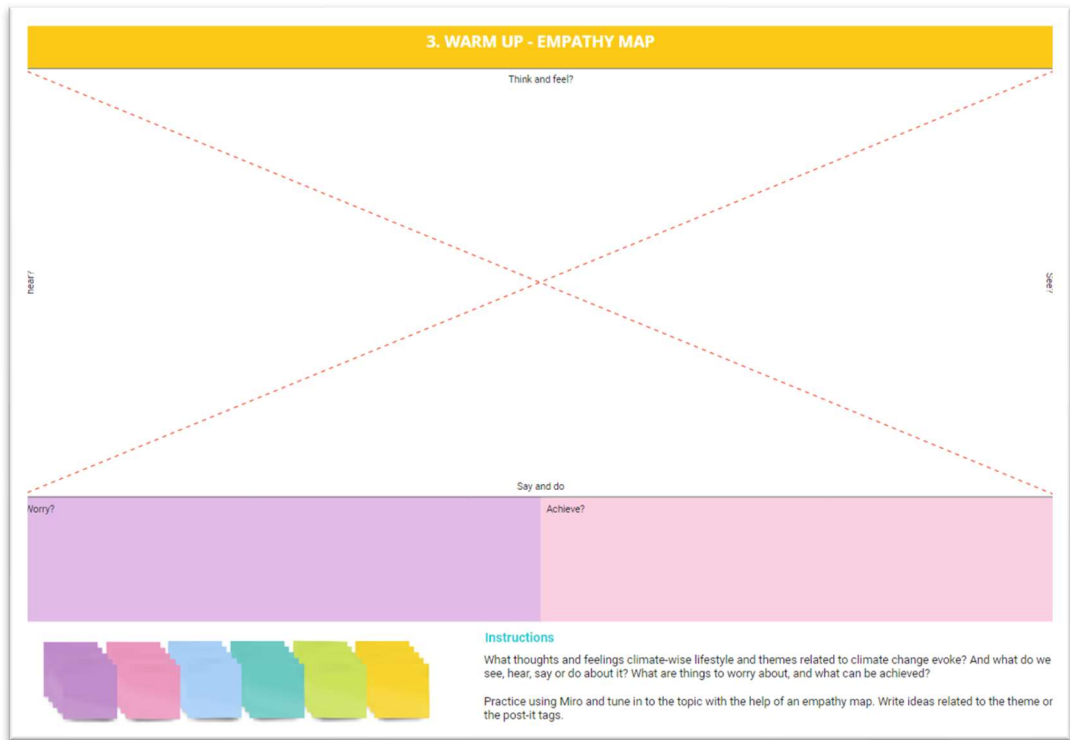


Figure 10. Empty Empathy Map Canvas

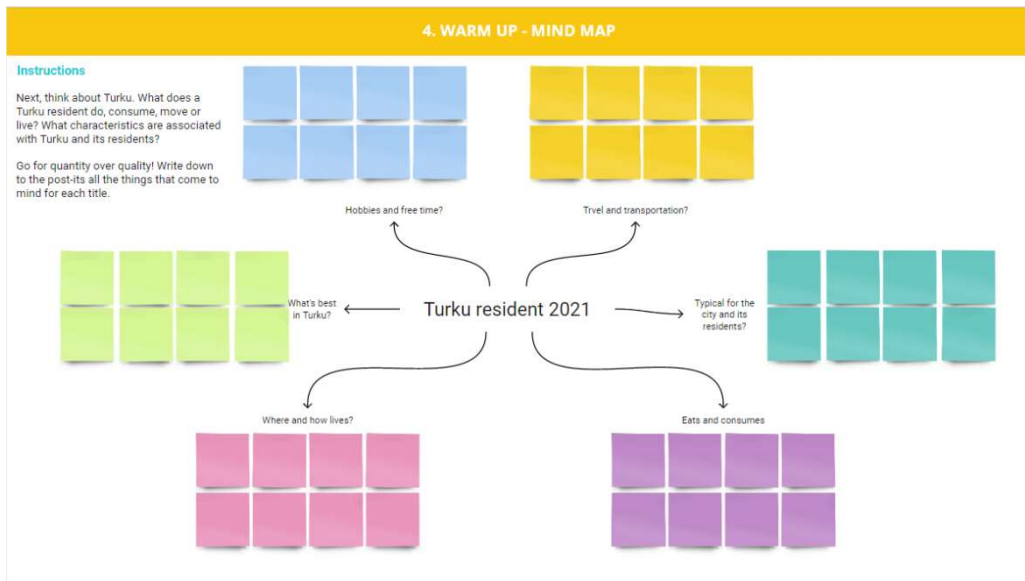


Figure 11. Empty Turku- Mind Map canvas

For brainstorming the characters of personas, an empty canvas with personal information and four domains: housing, food, transportation, and consumption, was created. An empty workboard in Miro is presented in Figure 12. A similar canvas was composed for each persona. After introducing the topic and the objective, the intention was that brainstorming would be conducted silently, as the assumption was that the participants did not know each other in advance. Canvases were meant to be discussed and monitored afterward.

The image shows a Miro workboard titled "11. PERSONA 5" with a yellow header. The main content area is divided into several sections. At the top left, there is a circular image of two mannequins. To its right is a section titled "BASIC INFORMATION" with the following fields: NAME, AGE, PROFESSION, SOCIAL STATUS, FAMILY, and DESCRIPTION. Below this section, the canvas is divided into four quadrants by a grid. The top-left quadrant is labeled "HOUSING", the top-right "FOOD", the bottom-left "TRANSPORTATION AND FREE TIME", and the bottom-right "CONSUMPTION HABITS". At the bottom of the canvas, there is a row of six colorful sticky notes in shades of purple, pink, blue, teal, green, and yellow.

Figure 12. Empty Persona canvas

The invitation was shared on the news page of the City of Turku and in the Facebook feed of TUAS and the author's private channels. The invitation to the workshop in Finnish is visible in Appendix 2. Unfortunately, there was a lack of participants, and only two persons participated in the session. Some brainstorming was still possible at the time of an event, and based on the discussions during the workshop, an additional persona, a conspicuous middle-aged consumer, was added. Since there were not many participants, co-creation was decided to be supplemented by semi-structured interviews for the groups not attending the workshop.

Interviews

Right after the workshop, a group interview with members of the youth council and interviews with two seniors and three family heads were scheduled. Interviews were carried out using the same workshop manuscript and were more discussion-based rather than following a strict plan. The same Miro workboard was used in all interviews, and previous results were supplemented. All interviews and both workshops were hosted via Microsoft Teams.

Second Workshop

At that point, the author had a second chance to host the workshop and join the development day of the Climate team on June 10th, 2021, with 10 participants. There the time constraint was even tighter, and the time was only one hour, but still, the workshop was fluently hosted, and a good amount of data was generated to supplement the existing data. In the second workshop, the range of personas was still supplemented with the sixth persona, a single adult.

Both workshops followed the same plan. The only difference was that the empathy map was used as a warm-up exercise in the first workshop and the interviews and the scenario map in the second workshop. First, the need for advising in using Miro was discussed. In either of the workshops, assistance in technical matters was needed.

Warm-up methods were introduced, and filling of the canvases started along with the discussion. Brainstorming of "doings, thinkings, and feelings" of the target audience through their experiences was then continued individually. Finally, the sticky notes were discussed. Thoughts gathered from the warm-ups provided background material for the personas' attitudes and values.

Warm-up approaches, empathy map, and scenario map were similar, but the empathy map evoked deeper thinking of the attitudes. All sticky notes in the canvases were considered where applicable when creating the personas.

Turku mind map was used to gather insights into Turku citizens' activities. The features and places highlighted in the workshop were used as part of the stories, where applicable. Mapped Turku citizen related topics were:

- Where they eat and consume.
- How they live.
- How they travel.
- What is typical for people in Turku.

- What is best in Turku.

After the second workshop, it was concluded that the data gathering was sufficient. Also, the schedule affected the conclusion. The original target was to hold one workshop for a maximum of ten people, and that goal was already exceeded.

After the warm-up methods, the persona canvases were filled one by one, silently for a short time. After filling all canvases, personas were quickly discussed. An example of a filled persona canvas is presented in Figure 13.



Figure 13. Persona Canvas - Teenager

Simultaneously the method for representing the personas was discussed with the commissioner. The idea of short stories was raised, and it was agreed that day-in-a-life stories would be written. Stories and shorter versions of the personas could be used for different purposes, and storytelling as a method could make the topic more tangible and more accessible for the audience to empathize with than, for instance, an infographic way of giving and comparing information.

Also, as a starting point for composing the stories, a value proposition canvas was composed for each persona so that their motivations and interests were possible to recognize. Information was gathered from the warm-up exercises, where the attitudes and values were discussed. Anna's Value proposition canvas is presented in Figure. 14 and all canvases in Appendices 3-5.

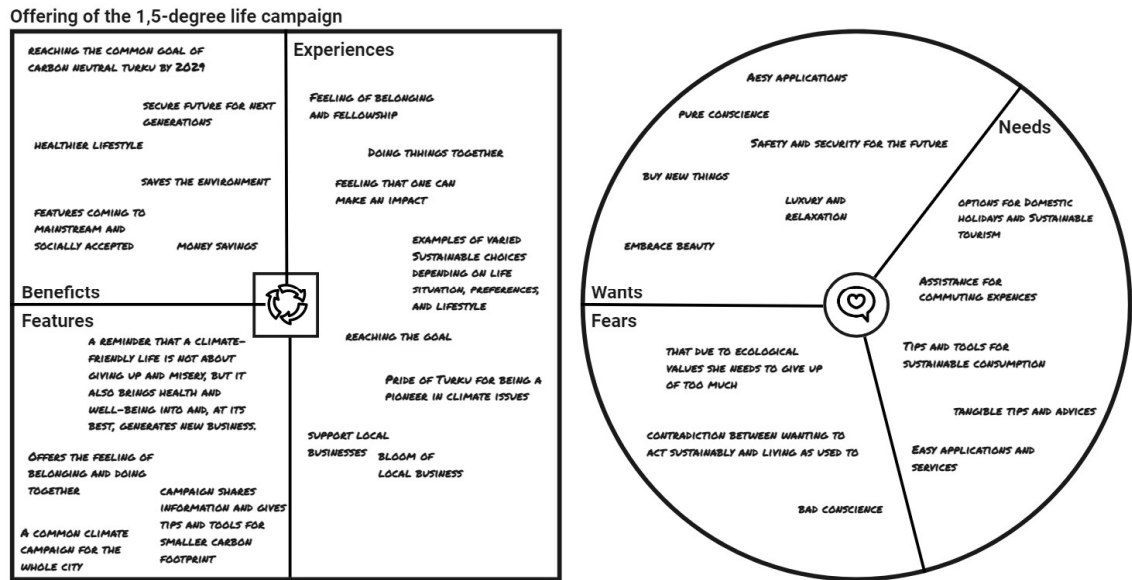


Figure 14. Value Proposition Canvas - Anna

Each story was written around one event or topic related to one of the four domains, such as becoming a vegetarian, sustainable traveling, combining errands, introducing to sharing economy, avoiding food loss, and sustainably-minded voting. All story plots were roughly sketched into emotional journeys to support the writing process. Eva's emotional journey is presented in Figure 14. and all emotional journeys in Appendices 6-8. Stories were composed during June 2021.

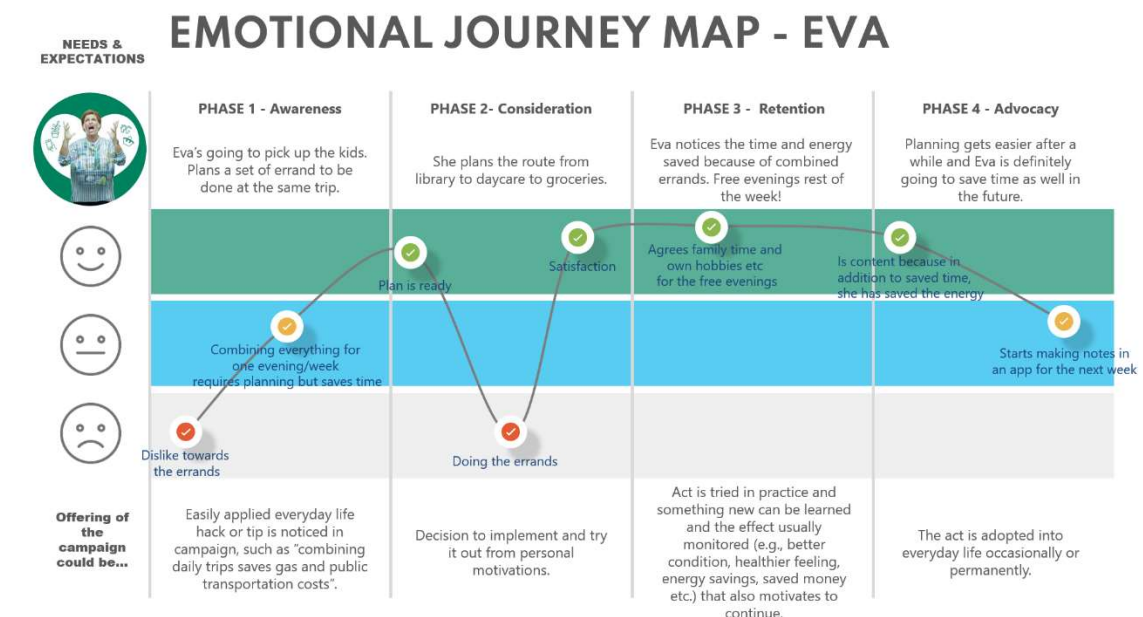


Figure 15. Emotional Journey Map - Eva

Finally, based on the generated data, the personas were created by the author. On the grounds of the filled workshop canvases as well as value proposition canvases and emotional journey maps presented in Figures 9-15 and Appendices 3-8, the characters, features, and the acts from the affinity diagram were divided between the personas. Then, based on the categorization work, a list of keywords was chosen for each to facilitate the sketching. Finally, with the help of keywords and low-carbon acts, the initial versions of the stories were sketched. In Figure 13 mapping and clustering of teenager's characters and features in Persona canvas in Miro is presented.

Also, the list of keywords and basic information, such as assumed gender and age, were given to the graphic designer of the City of Turku. A list of keywords was combined while sketching the first versions of the personas. Such a list of keywords of the "teenager" was vegetarian food, vege challenge, riding a bike, public transportation, carpooling, everyday activities, recycling, 2nd hand, social media-influencers. The list of keywords guided the graphic designer, and the selection of icons used in the illustrations was based on the list. Based on the given details and some iterative feedback from the author, the illustrations for each persona were created by the graphic designer. The intention was that the visual appearance would fit into the campaign and that the illustrations could also appear in other campaigns contexts. The illustrations are the ones appearing in this thesis.

Initial feedback was gathered during the holiday season in June 2021 from a member of the climate team and the communications department of the City of Turku to make sure

The motivation profiles were not incorporated in the development phase because, initially, the motivation profiles were only for the research portion. However, after finalizing the narratives, the 1,5-degree personas were evaluated in relation to the motivation profiles. As a measure of success, it was inspiring to notice that all motivation profiles were somehow represented. Therefore, referred representations are shared in the following summaries.

Janne

Janne is an active teenager who lives together with his single-parent mother. They live in a rented apartment. From the motivation profiles, Janne represents the carefree follower who appreciates the easiness, sense of belonging to a group, examples, and social media, among others. Janne's mother has been on sick leave for a long and, for economic reasons, represents the motivation profile of everyday survivor. Janne's pain points are lack of money and fear of not being socially attractive. Janne's narrative focuses on Janne and his mother preparing vegetarian food. In addition to the event, the story is incorporated with several low-carbon acts relevant to Janne's life, such as 2nd hand, public transport, kettle use, and switching off the lights. The concept of MIHI's free exercising was also adopted into the story. Adoption of MIHI required background research on where MIHI is organized and how Janne can get there. A summary of Janne's character with the illustration by the graphic designer of the City of Turku is in Figure 16, and the full story is in English in Appendix 13.



Figure 16. Janne

Ella

Ella represents the green forerunner who appreciates the opportunity to serve as an example, individuality, personal style and identity, green values, environmental friendliness. Ella's pain points are a frustration to the current situation and climate politics. She desires change and worries that the time to affect will run out. The narrative focuses on sustainable consumption through Ella renting a dress for the student union's annual celebration. Ella uses city bikes, avoids food loss, and pays attention to sustainable development by voting sustainably-minded candidates and signing citizen initiatives, among others. A summary of Ella's character with the illustration by the graphic designer of the City of Turku is in Figure 17, and the full story is in English in Appendix 14



Figure 17. Ella

Eva

Eva is the resourceful green who aims to reduce consumption and favors local production. The feeling of doing the right thing guides her actions. Eva's pain points are related to time and daily arrangements. The narrative constructs on combining daily errands, which is ecological in addition to saving time. Eva's family lives in a semi-detached house that is drilled in geothermal heat. Her hobby is taking care of the greenhouse. In the garden, there is a meadow for bees and butterflies. Sometimes Eva allows herself to act against her ecological principles, as surviving the rush years sometimes requires it. A summary of Eva's character with the illustration by the graphic designer of the City of Turku is in Figure 18, and the full story is in English in Appendix 15.



Figure 18. Eva

Anna

Anna lives in Portsa, and her story's narrative focuses on sustainable traveling. Also, sustainable wood burning is incorporated because she lives in a wooden housing company and uses the fireplace. Anna loves beautiful objects and represents the motivation profile of an impulsive buyer. Her pain points are related to bad consciousness of consumption. She also wonders whether her actions really matter, yet in terms of more pure consciousness, she tries to maintain ecological sustainability. A summary of Anna's character with the illustration by the graphic designer of the City of Turku is in Figure 19, and the full story is in English in Appendice 16.



Figure 19. Anna

Ossi

Ossi is the conspicuous middle-aged consumer who represents the motivation profile of comfort-seeking hedonist. Ossi appreciates comfort and pleasure, solutions that make life easier, new things, and experiences. Ossi understands climate change as a fact but foresees that technology and innovations will solve the problem. The narrative focuses on Ossi's transformation to become a user of sharing platforms and his sudden feel-good of offering experiences to others. And making a profit. Ossi also changes from an oil-heating mechanism with a water-air source heat pump. Even though Ossi consumes a lot, many of his novelties are economical. Only the motivating factor is in novelties and adopting new technologies, not necessarily in ecology. A summary of Ossi's character with the illustration by the graphic designer of the City of Turku is in Figure 20, and the full story is in English in Appendice 17.



Figure 20. Ossi

Eero

Eero is a senior from Iso-Heikkilä. He represents the traditional common sense who appreciates domestic and local production, durability, and tradition. Eero is worried about the future of his beloved ones and tries to adapt even though the entity of climate change does not entirely unfold to him. Eero is lonely but fortunately is visited often by grandchildren. The narrative focuses on such an event when a grandchild comes over. Also, avoiding food loss and sustainable consumption is introduced in Eero's story. A summary of Eero's character with the illustration by the graphic designer of the City of Turku is in Figure 21, and the full story is in English in Appendix 18.



EERO
76 YEARS OLD
RETIRED

Traditional Common-Sense






	Widow, grandchildren living in Turku keep the grandpa active.		Eero is thrifty by nature, doesn't waste. Doesn't quite understand why anyone should waste. But time changes, and he doesn't begin to judge anyone because of the spirit of the times.
	Lives in right-of-occupancy apartment in Iso-Heikkilä.		Eats varied but little. Knows what consumes, so there is little food loss. Occasional leftovers are immersed in a pancake or omelet. Has begun to use plant-based dairy products through visits of a vegan grandchild. Buy lake fish from a familiar fisherman, gets also eggs from him. The food circle offers activities to weekdays.
	Buys when needed. Uses local mall and finds basically everything from there. If something else is needed, asks for help from relatives.		Walks on near-by daily errands, travels by bus if needed.

Figure 21. Eero

4 RESULTS

This thesis aimed to develop content for climate communication that would encourage the target audience to adopt resource wisdom and low carbon acts and get the target audience to join to reach the goal. The objective of the commissioner, the city of Turku, is to be carbon neutral by 2029.

The output resulting from the service design process was six co-created personas living 1,5-degree life in Turku. The author had the honor to have the responsibility to create the personas, compose their stories and influence their visual appearance. Thus, the scope of the thesis was successfully completed, and from here on, the author waives the right to exploit the personas and wishes good luck for the personas in the future.

The proposed solution and the output, co-created prototypes of 1,5-degree citizens of Turku and their stories, enables climate communication also in other channels, not only online. As such, the stories were printed on cardboard and established in an exhibition on Turku Day on September 19th, 2021, in the City Hall of Turku. From there, the exhibition moved to another location for the rest of the year 2021, the shopping center of Hansa in Turku. That way, the target audience, the inhabitants of Turku, could be reached more extensively. However, personas and stories can still appear online and in other printed media. The output, the stories bring the fact-based topic more tangible to the audience. Therefore, enabling a solution that can be used in different media reaches the audience beyond technological know-how.

The service design process itself followed a typical service design process framework. The Design Council's Double Diamond framework was used, and the process was applicable for this purpose. The process framework paved the way for diverging and converging the thinking and guided the work towards the end.

As mentioned in chapter 2.6 Storytelling, a story is successful if it works on the audience according to the goals. A good story causes the audience to change their actions and attitudes and continues living through those. The goal of the stories was to share practical low-carbon tips to everyday life and motivate the reader to change the behavior. Based on the feedback, after reading the stories, 100% of the respondents stated that they had learned new, and 76% thought that stories could motivate them to change their behavior. Therefore, based on the feedback, the impact of the stories can be considered successful.

5 CONCLUSIONS AND EVALUATIONS

A scientific review preceded the output. At the beginning of the process, three research questions were addressed.

1. *What choices can a consumer make to live 1,5-degree life?*
2. *Can consumer behavior and decision-making be motivated by nudging, and how can nudging be utilized in promoting a climate-friendly lifestyle?*
3. *How to communicate the solution to the target audience?*

First, by formulating the research questions, it was estimated that the literature review would deepen the approach and give the required answers to questions that might arise during the process. Second, required background information was accomplished by responding to addressed research questions.

The starting point of the research led to the first research question: *What choices can a consumer make to live 1,5-degree life?* For that purpose, it was essential to find out the individual's role in recent discussions of mitigating climate change. Also, it was required to examine the policies that restrict and enable participation and what is required both at the national and global levels. Also, the definition of climate change was needed to clarify the context. Finally, the question was answered at the concrete level by compiling 1,5-degree life-enabling acts into an affinity diagram.

The second question: *Can consumer behavior and decision-making be motivated by nudging, and how can nudging be utilized in promoting a climate-friendly lifestyle?*, was addressed as most of the time adopting environmentally sustainable everyday acts, the motivation seems to be the driving force. Understanding the decision-making process was necessary because the 1,5-Degree Life campaign intends ultimately to influence the behavior by motivating people to act accordingly. Nudging to a climate-friendly lifestyle can be and is widely utilized. It was addressed that people are prone to nudges because of the predictable irrationalities and commonly recognizable biases that affect our decision-making process. That process could be influenced by offering more appealing visions, giving feedback, and ultimately experiencing environmentalism as a social norm. The study proves that there is room for further development and innovations for nudging away climate change. Instead of painting horror pictures, a positive we-spirit could also be brought along, emphasizing the will to fight. The research question was also responded to in practice by creating the stories. The ultimate purpose was to influence consumer behavior and nudge towards the common target of carbon neutrality.

The third question: *How to communicate the solution to the target audience?* is essential because the Municipal Act restricts the communication in question and the target audience, the city residents is broad. Communication needs to be equal to every person, and the shared information needs relevancy. Municipal act requires openness and interaction. Also, the perspective of the communication is residential. The challenge was responded by co-creating the profiles together with the residents and framing, in addition to statistics, together how to cover the public as widely as possible yet without discriminating against anyone. That challenge was partly responded to by leaving many of the features intentionally open. Of course, the entire population cannot be covered by six personas, but at least everyone can find some low-carbon acts that could be adopted. Many of the acts are also profitable in terms of saving money.

The process had its starting difficulties, and the format applied its shape. Still, it is estimated that the research base was successful and relevant and supplemented the service design process relatively well. After the process had fully started, no significant setbacks occurred. The scheduling and work division was successful and sticking in schedule was pressured by the holiday season. It was understood that delaying some part of the work would delay the whole process as people involved had their holidays.

The research base can be considered reliable and valid. The research was done from several sources, and referencing is consistent. Description of the design process and data gathering is considered transparent and open.

Mitigating and adapting to climate change are here to stay. The slower the changes are implemented, the more drastically the temperature rise will most likely be. It is addressed that the world has been changed throughout history by protests, strikes, and boycotts. Those are considered adequate. Violence is not. In addition, when the activity was backed by at least 3,5% of the population, the change was inevitable. Based on this, if, for example, a non-violent movement in Finland would want to impact and improve environmental friendliness becoming a social norm, approximately 192,500 people would be needed to participate. May this work be one attempt to call to action.

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Affinity diagram - Climate acts



Invitation to workshop

Miten elää ilmastokestävä turkulainen? -Ilmoittaudu 1.6. järjestettävään työpajaan

On monia tapoja elää ilmaston kannalta kestävästi. Mutta minkälaisia? Entä miten ne soveltuvat juuri minun elämäni? Tule mukaan luomaan ilmastokestäviä turkulaisia.



Työpaja: 1.6.2021 klo 10.00-12.00

Paikka: Teams. Ilmoittautuneet saavat linkin

Ilmoittautuminen 31.5 mennessä. Max. 10 osallistujaa

<https://link.webpolsurveys.com/S/6C9490131E6AF0B1>

Järjestäjä: Turun kaupungin ilmastotiimi ja Turun AMK:n palvelumuotoilijaopiskelija **Sanna-Kaisa Katajamäki**.

Moni miettii, minkälaista olisi elää Pariisin ilmastopimuksen tavoitteen mukaista elämää. Pitääkö sulkeutua kammioonsa ja olla kuin munkki, vai elää metsässä juuria pureskellen ja rakkasammaleeseen pukeutuen? Todellisuudessa on monia tapoja elää ilmaston kannalta kestävästi. Joskus omien valintojen tekemistä helpottaisivat hyvät esimerkit.

Siksi päätimme luoda ilmastokestävien turkulaisten prototyyppit. Sellaiset, joihin tavallinen turkulainen voisi samaistua. Mutta kuka tietää, minkälainen on tavallinen turkulainen? Ehkä juuri sinä.

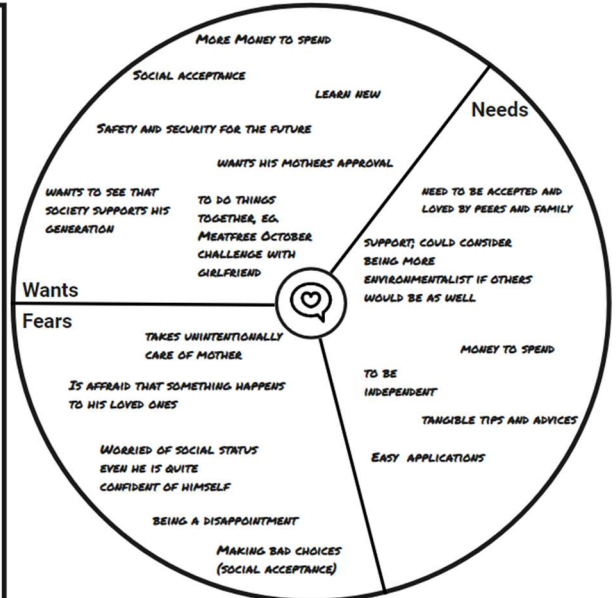
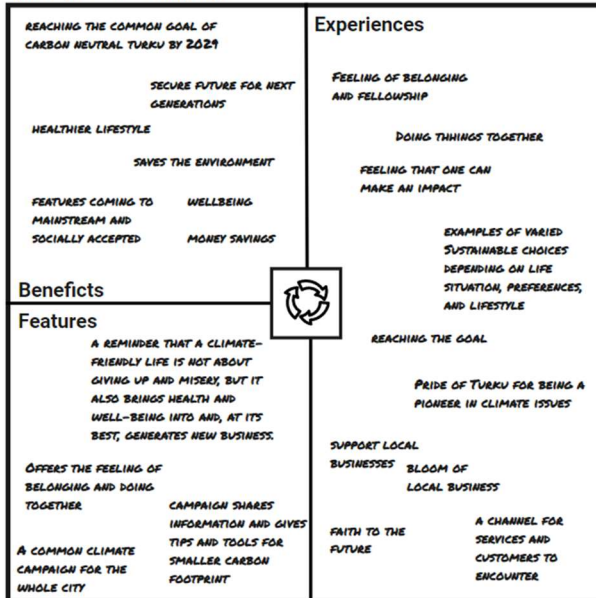
Ilmoittaudu siis mukaan.

Työpajan tavoitteena on ideoida yhdessä 4-5 kuvitteellisia turkulaista, jotka elävät tavallista elämää vähäpäästäisest. Työpajan luomat profiilit julkaistaan www.turku.fi/ilmasto -sivuilla ja niitä käytetään apuna ilmastoviestinnässä havainnollistamaan ilmastokestäviä elämäntapoja.

Value Proposition Canvases

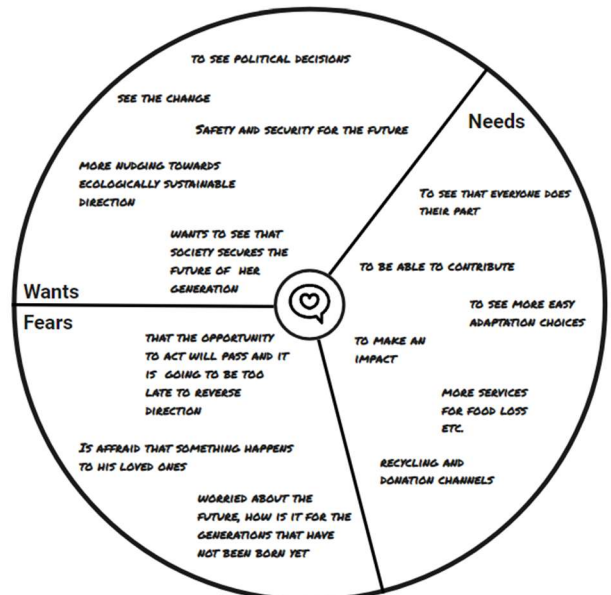
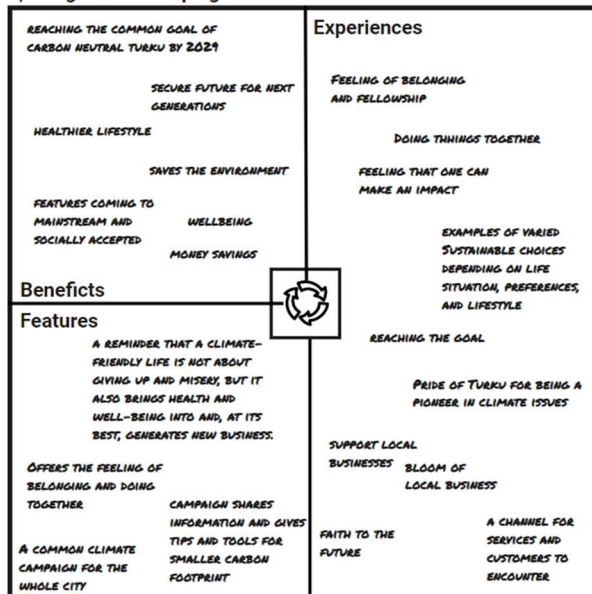
VALUE PROPOSITION CANVAS - JANNE

1,5-degree life campaign



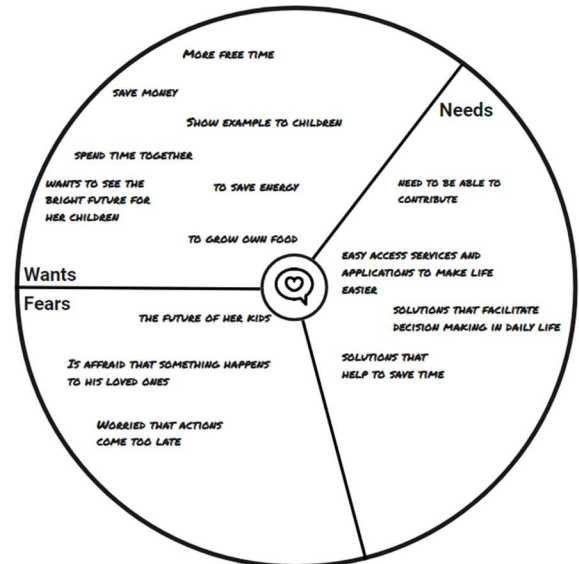
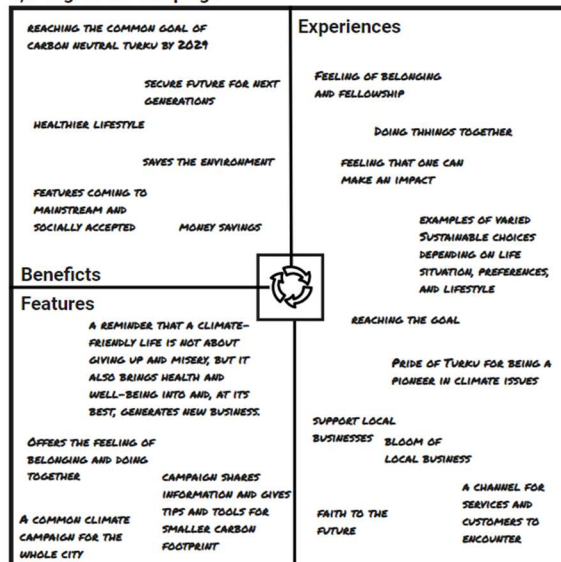
VALUE PROPOSITION CANVAS - ELLA

1,5-degree life campaign



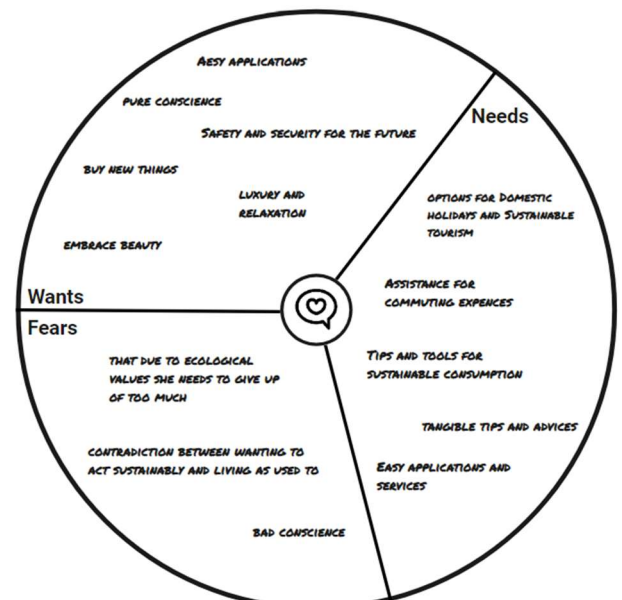
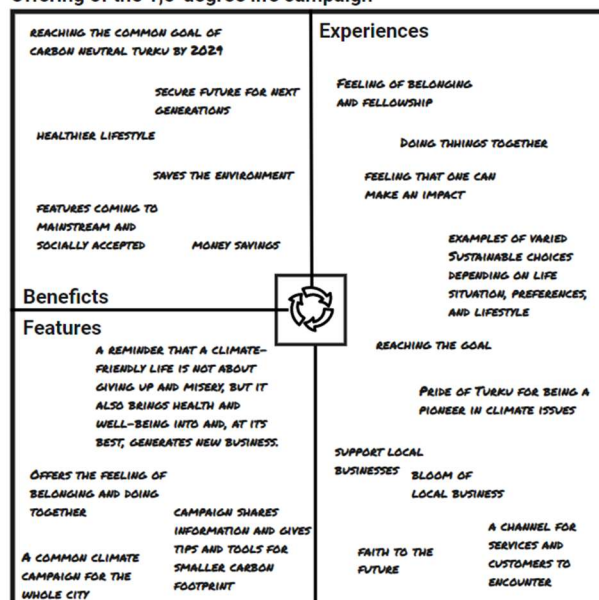
VALUE PROPOSITION CANVAS - EVA

1,5-degree life campaign



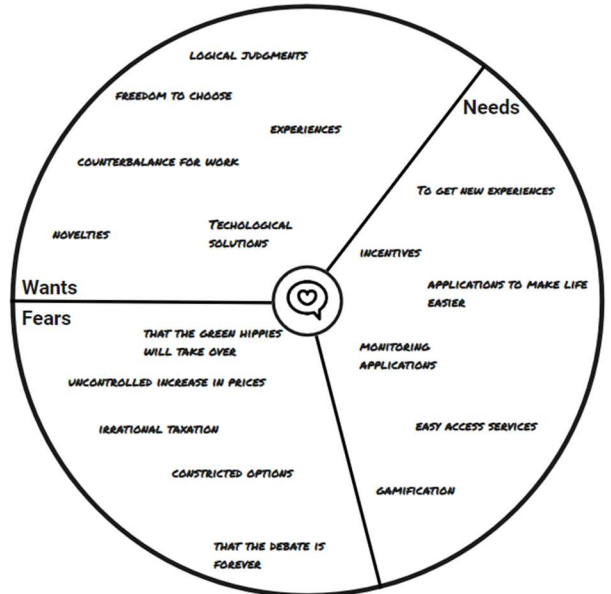
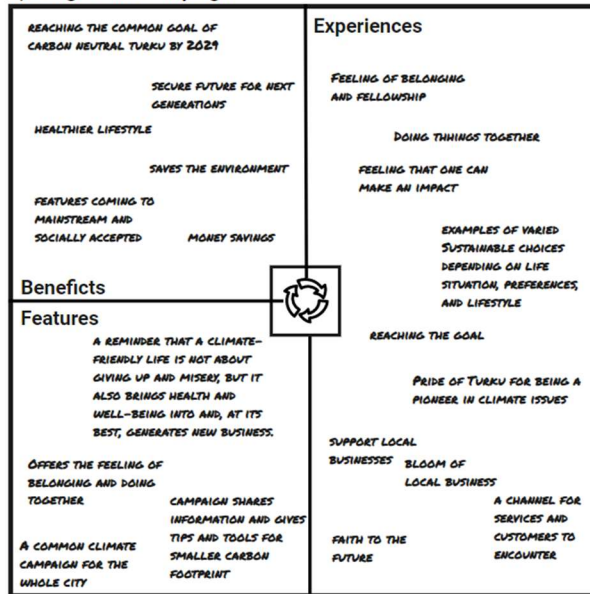
VALUE PROPOSITION CANVAS - ANNA

Offering of the 1,5-degree life campaign



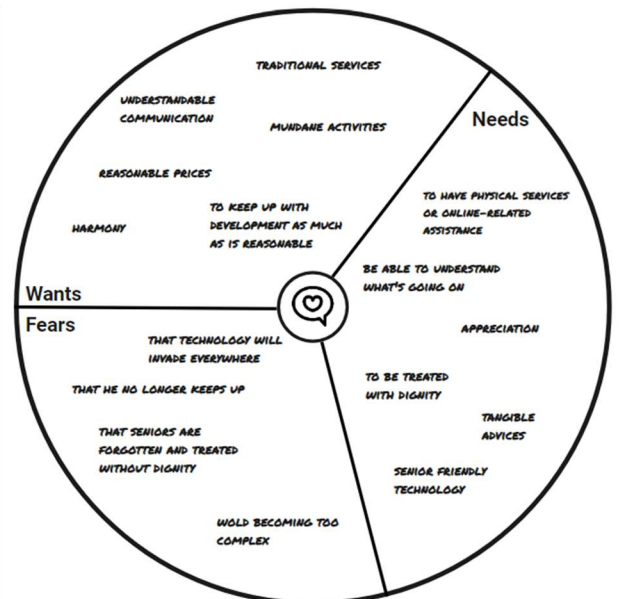
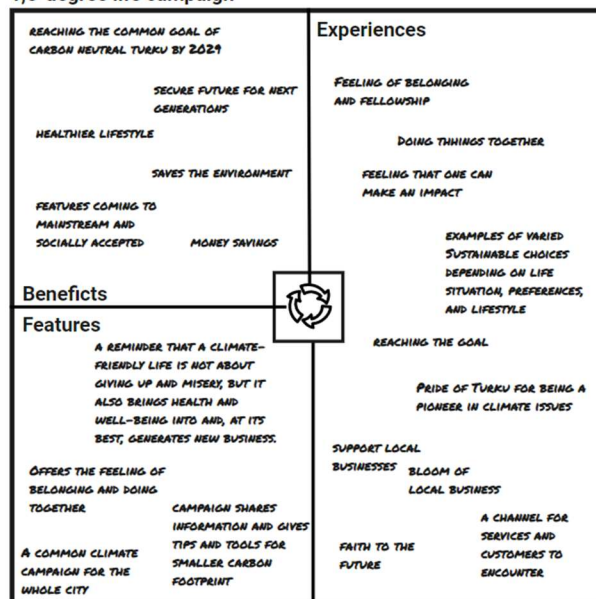
VALUE PROPOSITION CANVAS - OSS1

1,5-degree life campaign

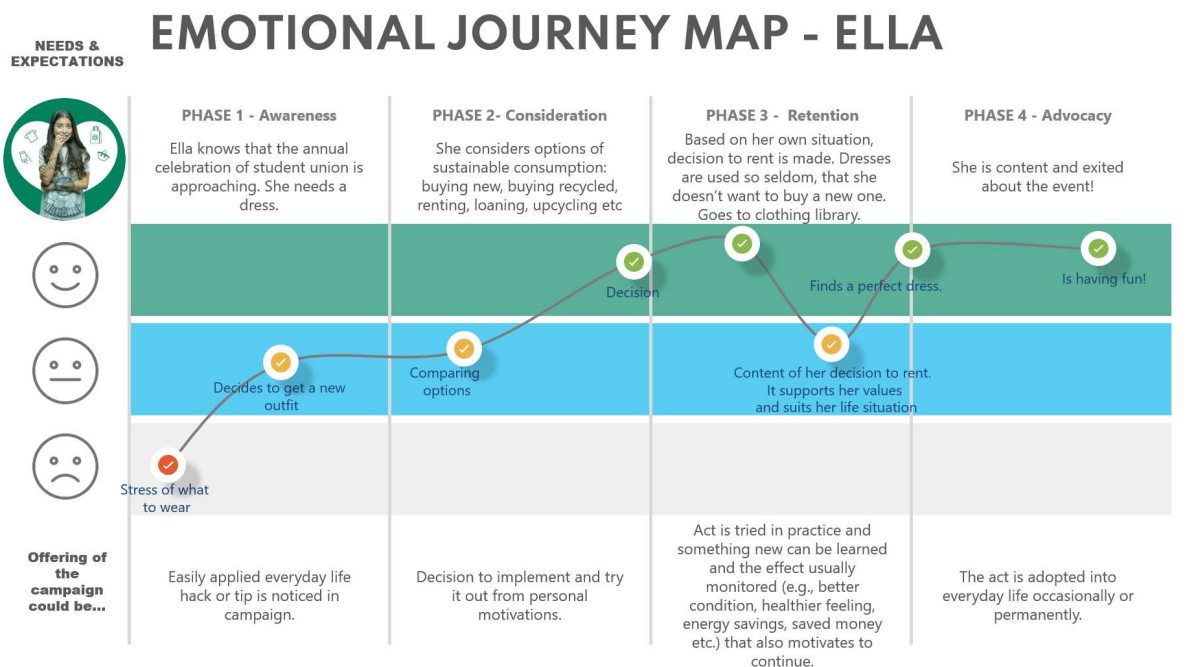
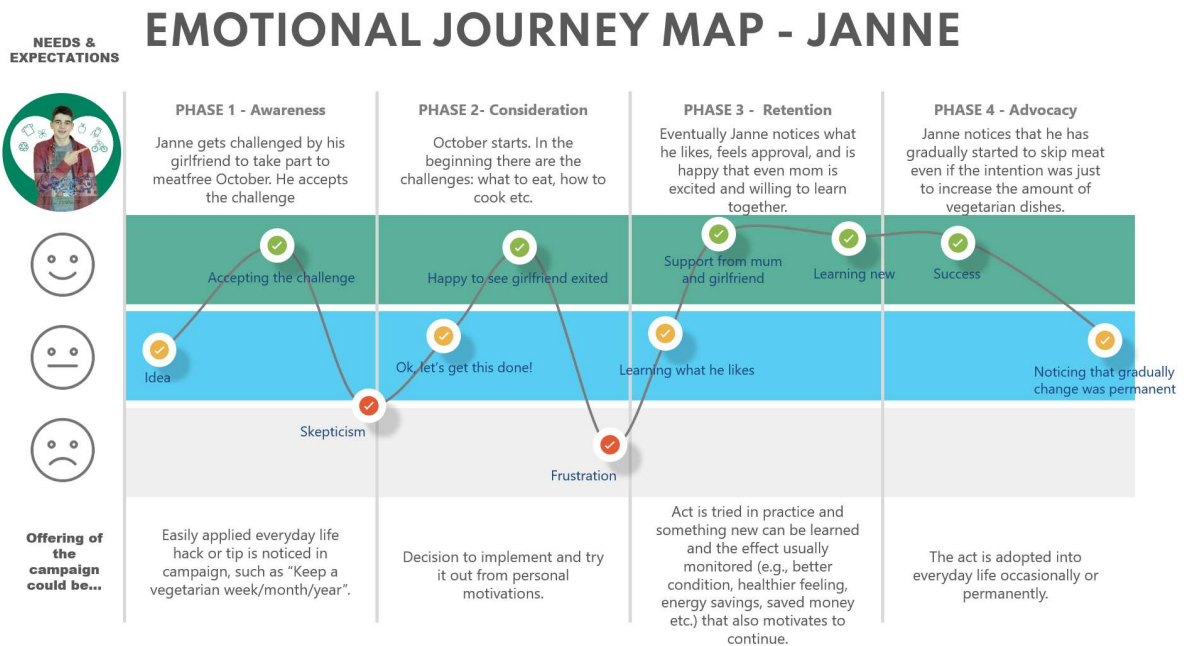


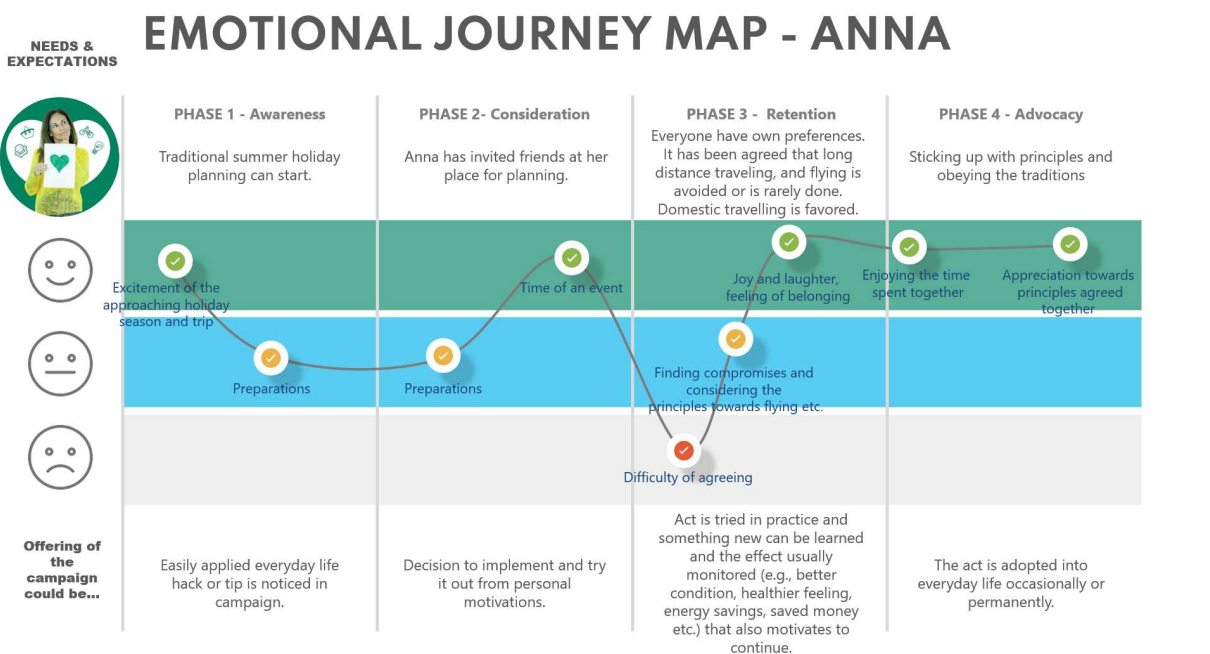
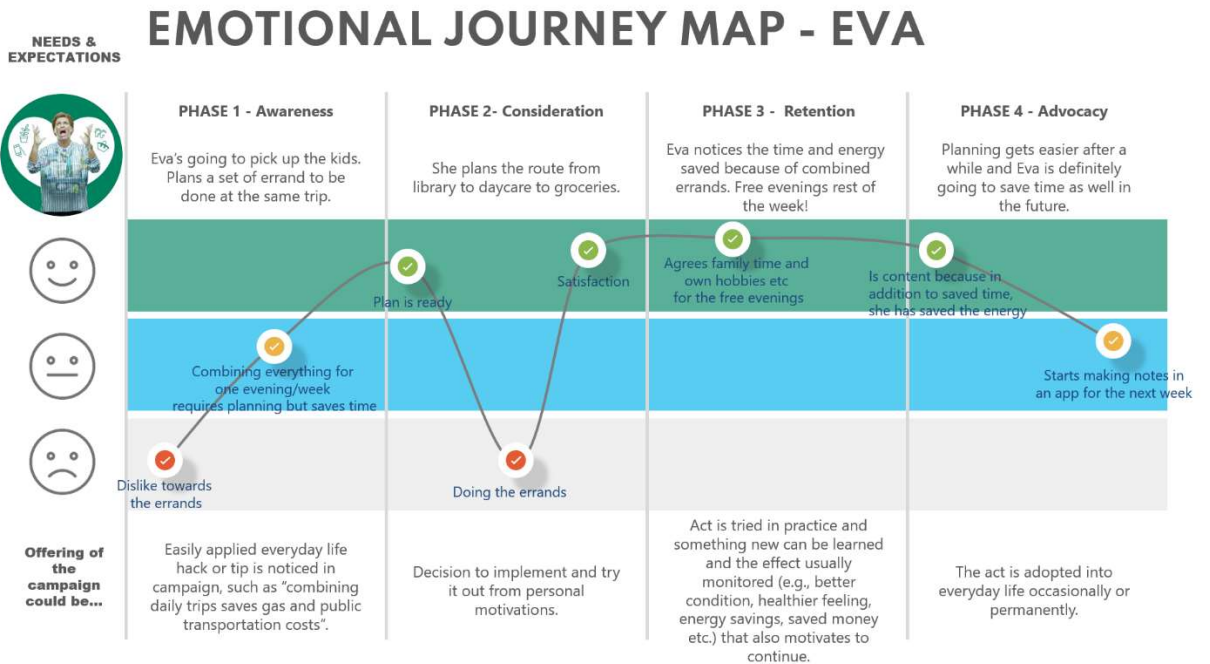
VALUE PROPOSITION CANVAS - EERO

1,5-degree life campaign

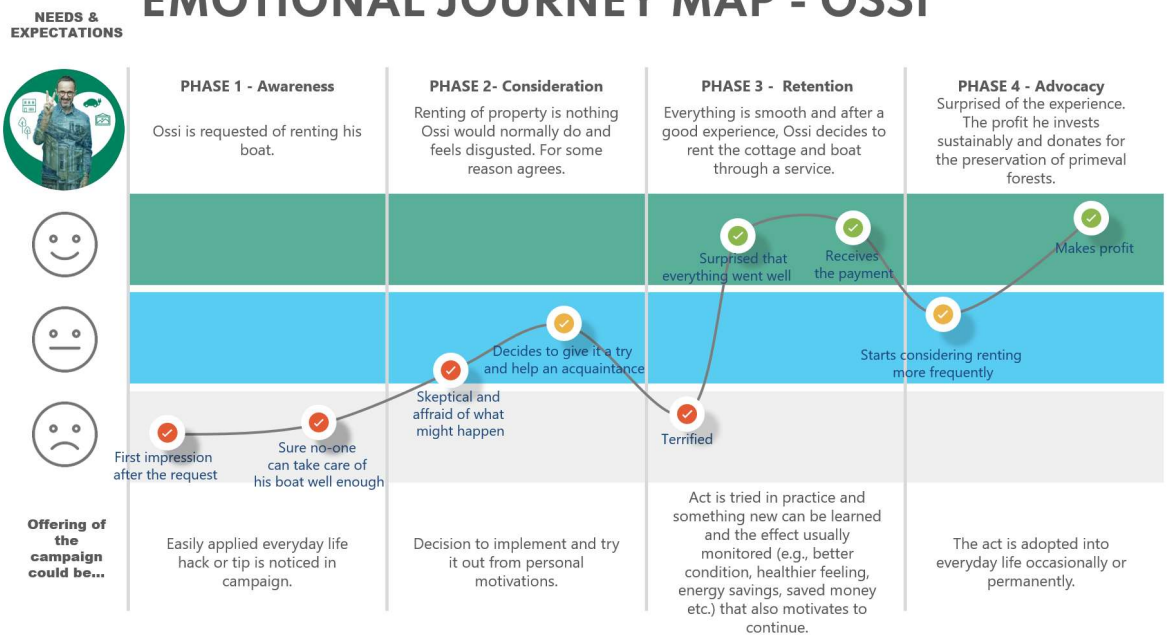


Emotional Journey Maps

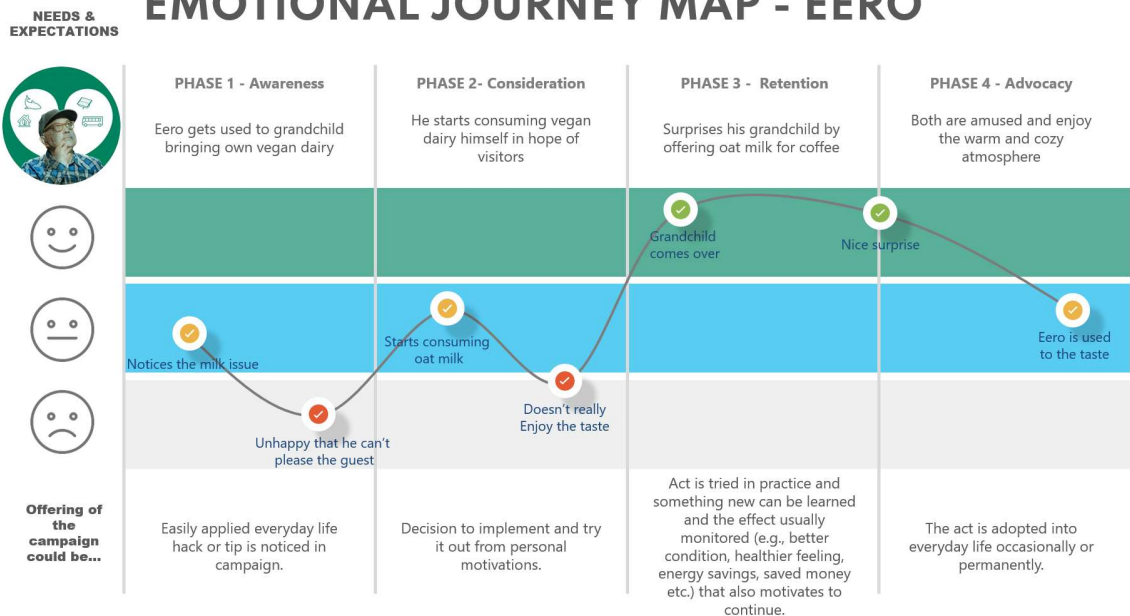




EMOTIONAL JOURNEY MAP - OSSII



EMOTIONAL JOURNEY MAP - EERO



Feedback Survey

Palautekysely

Opiskelen Turun ammattikorkeakoulussa ylempää ammattikorkeakoulututkintoa palvelumuotoilun koulutusohjelmassa ja teen oppnäytetyötä yhteistyössä Turun kaupungin ilmastotiimin kanssa. Kaupunki on julkaisemassa kampanjaa, minkä tavoitteena on jakaa tietoja ilmastoystävälliseen elämään liittyen ja motivoida kaupunkilaiset osallistumaan ilmastotyöhön. Kampanjan tarpeisiin on laadittu kuusi kuvitteellista turkulaista ja kertomukset, eränlaiset tuokiokuvat heidän tavastaan elää ilmaston kannalta kestävää arkea. Kertomusten takoituksena on tarjota samaistuttavia esimerkkejä ja mahdollisesti myöhemmin motivoida oikeita ihmisiä jakamaan omaa ilmastokestävää arkeaan kaupungin kanavissa.

Ennen kampanjan julkaisua haluaisin pyytää palautetta, jotta nähtäisiin, miten tarinat toimivat ulkopuolisin silmin. Vastauksia hyödynnetään omaan tarkoitukseen tarinoiden kehittämisessä. Vastaukset annetaan nimettöminä, eikä niitä julkaista. Tutustu liitteenä oleviin teksteihin ja vastaa niiden pohjalta alla oleviin kysymyksiin.

Kiitos avustasi!

1. Mitä ajatuksia tarinat sinussa herättävät?

2. Auttavatko tarinat oivaltamaan uutta? Perustele halutessasi.

Kyllä

Ei

3. Antavatko tarinat vastauksia olemassa oleviin tai lukiessa heränneisiin kysymyksiin?

4. Jääkö lukemisen jälkeen jotain epäselväksi tai askarruttamaan?

5. Uskotko, että tarinat voisivat motivoida sinua muuttamaan joltakin osin tapaasi toimia? Perustele halutessasi.

- Kyllä
- Ehkä
- En usko

6. Kuka persoonista on mielestäsi helpoiten samaistuttava? Perustele halutessasi.

- Janne
- Ella
- Eva
- Anna
- Ossi
- Eero

7. Vapaita kommentteja?

Submit

1 / 1

Original word clouds of the feedback survey responses

Questions of the feedback survey	Summary of responses (n=17)
1. What thoughts did the stories evoke in you?	<p>samaistuttavia tarinoita paljon arkea tehdä tarinat jotka helposti tavalla tekoja ratkaisuja asioita minussa valintoja herätti mieleen omassa ajattelemaan suuria kestävää miten mutta nähdä henkilöt olivat hahmot kestävä vaadi joitain hyvin ilmaston todentuntuksia kaikki hieman pienillä kannalta henkilöiden samalla teoilla toimia ympäristöä huomioon ruuanlaiton positiivisesti jäsenelty muuttamaan mukavia hyödynnetään löytää käyttö</p>
2. Did the stories help you to learn something new? Give reasons if you want.	<p>enemmän omassa tavalla tehdä voisin alkuunkaan arkisella arkisilla asennoituu aurinkopaneelin avaavat avartamaan eettisesti elämäntilanteeseen elämässä ettei hommata ilmastokestävämmin ilmastoystävällisemmin ilmastoystävällisempi juuri kestävästi kiihottomalla kohta mietittyä minähän monelle motivoi muuttamaan näinkin oivalluksia olivat panostaa pelastaa päivittäisessä saatava seökeästi sijaan tarinat tarvitse toiminnassa toiminut tulla useat vedekeittimen vettä vuoksi yhden yksityiskohtat ympäristön</p>
3. Did the stories provide answers to existing or raised questions?	<p>kyllä mutta miten voisi vastauksia tietoa tarinoissa tarinat siihen osalta olisi oikeastaan mahdollista lukiessa liittyen kysymyksiä kysymyksiin kannalta herännyt esimerkit yksinkertaiset yhdistetään varmasti vaivaa täydensivät tutkittua tuovat tunnetta tottakai tavallaan suoranaisesti siinä saattavat rohkaisevat pienempiä paras ottaa olivat muuttuisivat lainkaan kuvausta kestävä kannustavat kaikkea ikäisillä heränneisiin helpottaa esimerkkejä ekologisempi asioita</p>
4. Is there anything unclear after reading?	<p>tarinat hyvin mutta tulevaisuudessa tarinoissa vähän tarina mielestäni perheessä kaikki miten huomioon krsken haastavakin vapaaehtoisten kysymyksiin olivat vuokraus kohti yhdistysten epäselväksi vastaukseen paljon helposti täten aiempaan oliko onkin ottaa ruoasta sinällään herran viimeisessä ymmärtää haave ratkaisuja olisi pohdin sillä asioita vähävaraisesta uuden tarinassa tuosta tehdä käsillä lähtisin haluaisin pohtii toimijoiden</p>
5. Do you think stories could motivate you to change your behaviour in some ways? Give reasons if you want.	<p>voisi enemmän kasvisruokaa tarinat ainakin ajattelemaan aloittaa arjessa arkeen arkikäyttäytymistä asioista autoilut ehdottomasti esimerkit helpoilta helpompi henkilöihin huonoa ilmastoystävällisempiin jatkuvaa joita jotain käyttöön lähteistä mahdollisuuksia minun minut muutos nurkan omaan omatuntoa opetella opettivat ottaa paikallista pienemmistä pyrkisin ratkaisuihin saavat samaistuminen suosisin tarinoiden tarinoissa tehdä tulevat tuntumaan turhat uskottavaa vedenkeitin vähentämään</p>

<p>6. Which personality do you find the easiest to identify with? Give reasons if you want.</p>	<p>elämäntilanne haasteet auttavat elämä elämäntilannetta esille hyvin hävikki ikääni inhoan itsellä jollain joten kaikki kuuluisat käyttämään lapsiperhe-elämä lihanton lokakuu lähes lähinnä lähinpänä mukaan mutta niinkään nuorten oikeasti ollut oppimaan parhaani perheenäiti pyrin rauhallisuus ruokaa ruuhkavuodet samaistuttava samanlainen samanlaisia silloin tapaa tapoja tarinan tietoisesti tulevat tuollainen tuollainen tyylliset tähteet uusia valintoja</p>
<p>7. Other thoughts?</p>	<p>ajatuksia arkea asiaa hyvin olisi ossin tarinoita bongaaVINANI erilaisten esimerkkejä ettei hahmoista helposti hienoista hillitsevä ihmistä ilmastonmuutosta kehityksen kenties kevyesti kivasti kokonaisuus lukenut lyhyt lähelle merkitystä mielenkiintoinen nuori oikein osoitetaan pisti pojan samaistua samaistuttavaola selkäesti sidottu sillä tapoihini tarkoituksellisia tehdä teksteissä terävöittää tosiaan tosin tällä tärkeä tärkeän voivat yritysten</p>

Story - Janne



Janne plays futsal at MIHI's free exercising, and the training at the school of Runosmäki is over. Janne gets home on a friend's father's ride. Usually, he should take the bus home to Halinen, but it's nice to get a ride and be home a bit earlier. Sometimes the days get a bit too long, when the school days are long, and there are hobbies in the evening.

I'm starving! Mom's home. Mum's actually always home because she's been on sick leave for a long time. Otherwise, Janne wouldn't mind, but sometimes it would be nice to have a little more money to spend. Mum has always been thrifty and economical.

Janne has known since childhood to turn off the lights and not waste water in the shower. And it's okay.

Luckily, sports gears and clothing can be bought 2nd hand very quickly nowadays. In addition, it has been agreed with the mum that if Janne takes care of unnecessary clothes and goods for circulation, he can keep the money earned from the sale.

Janne has a couple of favorite apps that make things really easy: just take pictures by phone and post the announcement to the platform. Mailing is also easy cause you can just grab the parcel and send it from a nearby convenience store.

In the autumn, Janne took part in a meat-free October persuaded by his girlfriend. With the chain of events that followed, he has gradually given up eating meat. So, the upcoming Christmas with its vegetarian dishes feels a bit terrifying. Still, since Mom and Janne both like to cook, the success in vegetarian Christmas dishes has been taken as a positive challenge.

And that is what they practice today as well. Mum considers it essential that an active teenager receive enough protein from vegetable food at a growing age. So, she obliges Janne to learn nutritional recommendations because Janne was the one who wanted to switch to vegetarian food in the first place. But really, the vegetarian food suits the mother's stomach much better as well, so the transition hasn't been a problem in the family.

At Dad's, they're a bit sniffy about the vegetarian diet, but sure they'll get used to it, too. Janne clicks on the kettle. The water is much faster and more energy-efficient to boil with a kettle than on a regular stove.

Story - Ella



Ella grabs a leftover lunch on the way home. Ella often favors leftover meals from restaurants due to time and money savings. Some restaurants selling leftover dishes locate nicely on the way to work. Ella is studying in Turku for the third year. She is working occasional shifts around the city along with her studies.

Ella has moved to Turku from elsewhere from Southwest Finland to study, and the Ylioppilaskylä has been perfect for living. Ella has acquired almost everything for her home from the student recycling groups. The goods circulate quite unbridledly well: What is not found it

is not needed! Ella gets quickly by city bikes to school and work shifts, and it hasn't even been necessary to consider owning a bike. Last summer, Ella found a lovely community and a hobby in the allotment garden close to Ylioppilaskylä, and the harvest was surprisingly good!

For Ella, sustainable development is an absolute value, and climate change is a genuine concern. Fortunately, she sees, everyone can try to mitigate it. Of course, the student's life is often reasonably sustainable, and for economic reasons; students live tightly, consume less, and favor public transport. With sustainable lifestyles, everyone can make a difference, but influencing structures is crucial for her.

Ella votes for sustainable candidates, signs citizens' initiatives, and participates in peaceful demonstrations. She doesn't consider herself an activist, but that's the only way for her.

Ella would prefer to see the incentives to change shops and restaurants' selection to easily make sustainable choices. Then the responsibility and choices would not lie that firmly on the shoulders of individuals. For example, the attractive placing of vegetarian food at the beginning of the line would undoubtedly nudge diners in student restaurants even more in the direction of vegetarian food.

Ella strives to influence student restaurants and other matters through the student union. The student union's annual celebration is approaching. Although Ella has been impressed by the city's flea markets, this time, she will still be visiting a clothing library on her way home. Festive clothes are used so rarely that Ella prefers renting. Once the studies have been completed and the balance sheet is better, Ella intends to buy a membership of the clothing library. For this purpose, she found the perfect outfit for the celebration!

Story - Eva



Eva is ending a remote working day in the new, geothermal semi-detached house in Hirvensalo. She's heading to pick up the kids. Before leaving, Eva quickly goes around the yard watering the plants in the utility garden and harvesting the crop. The harvest seems promising.

The meadow left for pollinators in the corner of the yard is teeming with bees and butterflies.

Eva doesn't enjoy running errands and has become quite efficient in getting everything done at once. Before picking up the kids, Eva visits the library. She has arranged a couple of flea appointments in front

of the Hirvensalo Library. The charging point is full, but conveniently one car leaves the charging point, and Eva can plug hers. Eva throws a bag of small children's clothes to a buyer in the library courtyard and buys a new kickboard for her son from another.

From there, she goes to get the kids. The day-care's annual clock had shown that the strawberries were about to mature. We want strawberries, back seat insists! Eva stops at the supermarket to pick up pre-ordered and pre-packaged food for the week. The back seat doesn't get the strawberries just yet.

Eva would prefer to buy organic food directly from the producer. Still, since the rush years and continuous money spending, she has allowed herself to buy convenience food and others. Of course, Eva efforts to favour organic and plant-based products, but some are not so sustainable. However, with the help of a well-designed list, food waste has been kept to a minimum.

Of course, overkills also happen... Her spouse comes home and as agreed, stopped at the city's shared waste food cabinet on the way home to drop rye flour that was left over from sourdough baking. Eva got carried away with shopping for flour, and eventually, she had no time for feeding the sourdough. Fortunately, it is possible to recycle even food.

The evening happens to be free for parents because thanks to the driver's shifts agreed between the parents in the surrounding area, there is no need to take anyone anywhere today. So, for a long time, maybe just the two of them go for a long run on Uittamo.

Story - Anna



The light is slowly starting to appear again at the end of the tunnel. The winter has been long and the work challenging. The spring sun has begun to warm up so that it is appropriate to start planning for the upcoming summer holiday. Friends are coming over to make traditional travel plans. Anna is working on the catering when the guests arrive.

Anna places her latest treasures, unique vintage glasses, on the table and pours organic Italian wine into them. Finally, she puts the snacks she has picked up from the hall. Travel planning can begin. The atmosphere is warm and enthusiastic, partly

due to the heating from the old fireplace of the idyllic wooden housing share in Portsa.

Home is important to Anna; she loves the abundance of colors and beautiful objects and things. A particular passion for Anna is vintage dishes and collecting them. In addition, Anna would like to buy everything recycled, except for energy-efficient household appliances, or favor responsible producers. Still, the desires take over from time to time, and the principles and good intentions are forgotten. Sometimes Anna tries to compensate for bad conscience caused by impulse shopping with other sustainable choices. Yet, she has decided not to worry about it too much because choosing the best option is not always possible.

The home is right now at its best. At the edges of early spring and late winter, when it is still cold yet, dripping eaves and increased sunlight are already making promises about more. House is electrically heated with wind power. Anna loves the heart of the home, the old fireplace, which keeps the home warm during the winter season. But, of course, the problems related to wood-burning emissions are known; Anna is cautious about how she burns a fire in the fireplace. Anna ensures that the wood is small and dry and that only a necessary amount of wood for the heat is burned.

- Always light the fire from the top, never burn debris or full nests, add wood only after the previous ones have burned. Observe the color of the smoke—the instructions from childhood echoes in her head.

Over the years, women have traveled around the world. Still, the direction of travel has permanently moved closer and closer, and there have been hardly any more long-distance trips. If possible, everyone would like to reduce and avoid flying. Unfortunately, long train journeys must be made during holiday seasons because of Anna's poor remote work opportunities.

The decision-in-principle was made a few years ago – at least every second trip together is made in Finland. As the last year went cycling in Estonia, it was decided to stay in Finland this summer. One dreams of the sea, the other dreams of a city. The third one's looking for the woods. Women laugh ironically at the fact that even planning follows traditions - it is difficult. Best of all, Finland offers all that!

Story - Ossi



Ossi hops on his new street road bike from Kupittaa Science Park and heads towards home to Vasaramäki. The bike is the latest enthusiasm, but unfortunately, today, he must head straight home instead of a long ride. He is needed home to catch up with the air source heat pump installers. Ossi and his wife have decided to replace the old oil-heating mechanism with a water-air source heat pump. Ossi applied for a grant from the ELY Centre to change the oil system of a detached house. With similar economic incentives, even a more resilient consumer would be able to achieve more sustainable actions." Ossi ponders.

Ossi notices the phone. It's his son. Video calls have become a habit; it's nicer to talk when you see who you're talking with. Live's been quite comfortable lately. Of course, work takes time and its toll, but one can counterbalance the hard work. The City Theatre has offered thrilling experiences throughout the winter and the restaurants of Vähätori and the riverside for first-class dinners. In restaurants, Ossi has accidentally become acquainted with vegetables and vegan dishes during the harvest season. Why not try these new things at home with wife sometimes? The electric charging plug was also installed effortlessly in the detached house property when a new and, ah so quiet electric car came permanently into the yard.

While chatting, Ossi is excited to talk about visiting the cottage to see the consequences of winter. The place is relatively unused during the winter season because it is challenging to travel to the island in winter. So instead of regular heating, Ossi has tried only to heat what's needed for dry-keeping. With the help of a frost watch, the temperature had been adequate and kept the places dry and in good condition.

As a transition from the cottage news, Ossi's son can move to the initial reason for calling. He asks Ossi if his wife's sister could have rented a boat for a few weeks in the summer. At first, Ossi is terrified of the idea that someone else would use his boat. Sure, they'd just mess up and break the gorgeous Lady. But for some reason, whether it's a feeling, luck, or chance, he decides to surprise and agrees to the proposal. Why not, as long as everything is agreed in writing, and not too much discomfort is caused to Ossi.

A couple of months later, the boat has returned to its owner, and compensation was paid for the use. Ossi feels good. The boat remained intact and returned so neat that Ossi suspected that it would not have been used at all. Best of all, his son's wife's sister was almost touched by the chance of a successful summer trip.

Ossi has started considering renting the boat and the cottage as both are often unused during the year. So Ossi decides to give it a try. It feels more secure to share the property through a service. Ossi invests the income from renting in sustainable sites and donates a small amount to protect the ancient forest at his son's suggestion. All this has suddenly made him feel good. It's possible to share and enable the dreams for the use of others as well. Best of all, Ossi can make a profit!

Story - Eero



Eero takes his morning walk around the old observatory. At home, Eero grabs nature magazine from the shared magazine and bookshelf downstairs and heads to his right-of-occupancy apartment for morning coffee. The downstairs neighbour organized a magazine shelf a couple of years ago. It's been functional and has a lot of use.

Eero has spent most of his life in Iso-Heikkilä and has got on well. However, it's a bit lonely sometimes. Fortunately, the grandchildren have stayed in Turku and keep Grandpa's mind refreshed by their visits. In addition, Elsa is coming for coffee tonight.

Eero immerses himself in a nature magazine with a fishing theme. Eero was once an avid fisherman and still prefers to eat mainly Finnish lake fish. There's nothing better than a fried perch fillet! Lately, Eero has had to learn even that skill by himself. The best perch fillets Eero buys directly from a familiar fisher. He gets tasty eggs through the same acquaintance. And those Eero can get from nearby. It's nice that the local food district also provides comfortable contacts and activities to everyday life. There's not much food waste in Eero's kitchen. Eero knows from experience what he eats and what can be used to prepare a new meal. He prefers to immerse aging dairy products in an omelette or pancake. Eero is thrifty by nature and doesn't waste. He doesn't quite understand why anyone should waste. But times change, and he doesn't begin to judge anyone because of the spirit of the times.

Eero awakes to the doorbell. Elsa pops in with an expiring vegan bun and oat milk for coffee.

Elsa bursts out laughing when she discovers that Grandpa has already tabled his own oat milk. You never know when you're going to have visitors, Eero says with a smile. In the hope of visitors, Eero has gradually started to favor plant-based dairy products over animal products. And eventually, Eero's getting used to the taste.

Elsa and Grandpa like to ponder the news and phenomena. From Elsa's tip, Eero has calculated how much money he could save by renting solar panels. Part of the rent can be credited nowadays from the electricity bill.