Appendix

Innovation strategy for Pyropower for introduction in European market

Masters thesis
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Appendixes

Appendix 1 Design brief

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Appendix 3 Future Practices

Appendix 4 Interview guide

Appendix 5 Estimates

Appendix 6 Biochar applications

Appendix 7 Factor clustering workshop

Appendix 1

Introduction

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

Pyropower is a start-up working in the field of clean tech energy, based in Delft. Pyropower believes in decentralized ways of waste to energy for social and sustainable impact. Pyropower currently is working on a kiln for farmers in Indonesia to provide them a better solution to manage the waste and increase farm productivity. For farmers in Malawi, Pyropower is developing a household stove to meet their needs of availing viable and non-toxic source of heat. Pyropower uses the principle of pyrolysis to manage the bio-waste and produce biochar and heat. The technology that is used in kiln and stove produces biochar which is a carbon rich compound capable of improving soil health by retaining carbon during pyrolysis process. The technology also produces heat as a bi-product which can be used for different purposes such as drying coffee or generating electricity or drying crops etc. Pyrolysis is a process of chemically decomposing organic materials in absence of oxygen at elevated temperature. As oxygen is not involved in the process, the carbon from organic matter does not react with oxygen to form harmful compounds of oxygen-carbon. Pyropower makes use of the design of the product, working principle and properties of actors to keep oxygen separated from the flame. Pyropower's current business model revolves around biochar creation and heat production and Pyropower helps in making suitable use of the biochar and heat. As a part of implementation strategy, Pyropower is working on collaboration with SCOPI (Sustainable Coffee Platform of Indonesia) and an organization of 1500 farmers from Indonesia to pilot the project. For project in Malawi, Pyropower is working with an NGO to reach out to families in Malawi.

The global biochar market is supposed to increase to 3.1 billion by 2025 and is expected to increase at a rate of 13.2% CAGR as reported by Grand view research. Europe market is second largest market for biochar in world. Europe market for biochar is expected to increase from 0.59 billion in 2020 to 0.75 billion in 2025 which is about 25% of global market size. The market is mostly represented by farming (45%) and includes other sectors such as gardening, fuel cell, filtration industry etc. Moreover, applications in energy production and greenhouse gas remediation are expected to provide newer opportunities in this sector. Major sources of organic matter include garden wastes, agricultural waste, vegetable productions, textiles, paper industries, biogas plants etc.

Pyropower senses a potential for the technology in Europe and so, wants to introduce the technology based on the principle of pyrolysis for a suitable market in Europe. Thus Pyropower needs to look forward a couple of years in the future, create a vision for the start-up, understand and find a suitable market segment, build a suitable technology for the market, and create actionable steps for the future. The thesis would entail the understanding of European market for technology proposed by Pyropower, design of technology to meet the needs of market and a go to market plan for the Pyropower.

references-

1. Biochar market size, share and trends analysis report by technology, by application, by region and segment forecasts 2019-2025 (April, 2019) retrieved from https://www.grandviewresearch.com/industry-analysis/biochar-market

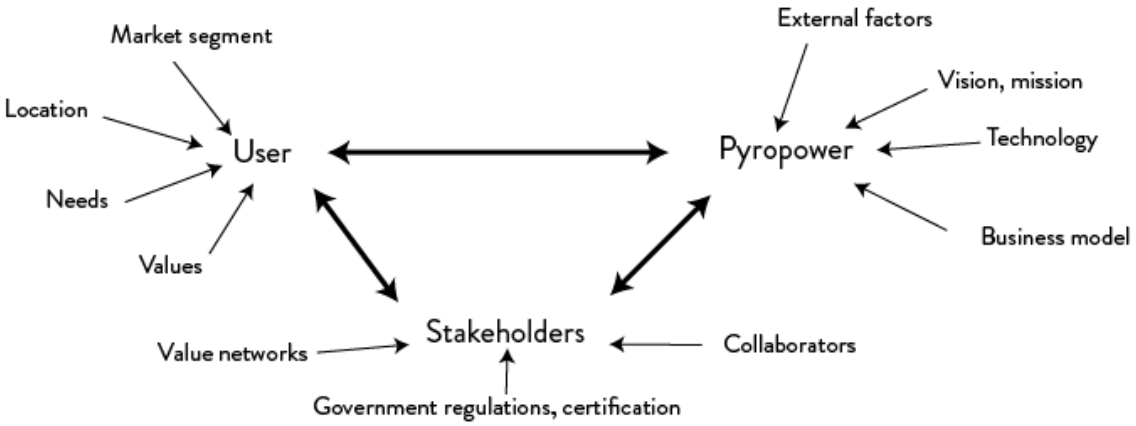


Figure 1- Understanding major components of the assignment

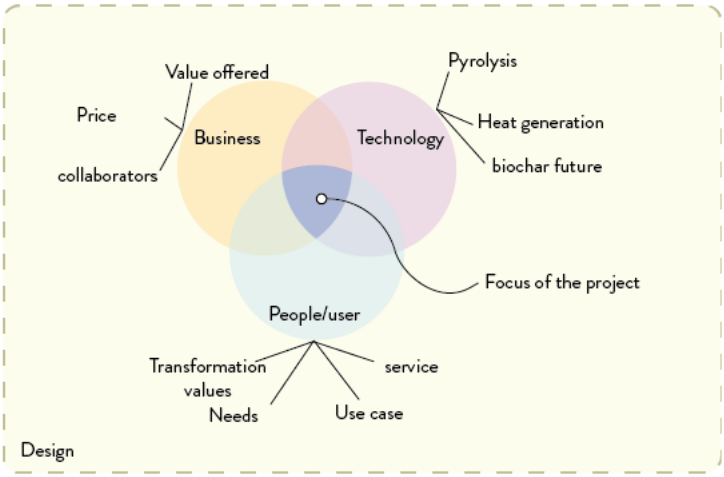


Figure 2- The assignment breakdown as a combination of people-business-technology

Problem definition

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

Pyropower has decided to use the technology for European market. However, the start-up needs an innovative vision for 2025 and a strategy to achieve the vision. Accordingly, the new problems Pyropower is facing are

'What is the vision for Pyropower's Europe project and what should be the strategy to achieve the vision'

Pyropower intends to use the principle of pyrolysis for European market but the same product and business model that is used in Indonesia or Malawi might not be suitable for European market. Thus, adding to the previous problem, Pyropower also has to answer the question

'what is the new business model and product/service concept and what are the steps to be taken to achieve the goal'

Assignment

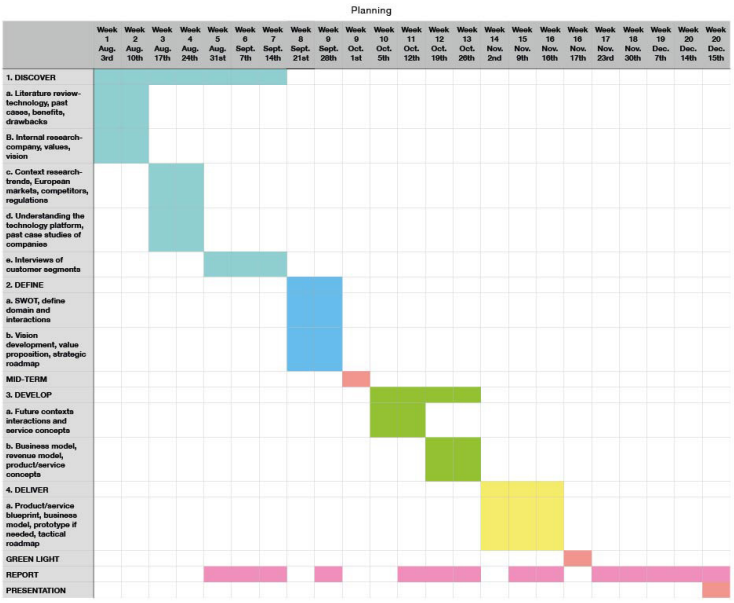
State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

The vision created for Pyropower will help drive the next decisions taken for developing the business in Europe. The initial business model focuses on relatively newer future whereas innovation strategy and road map help in achieving vision from the initial business model.

The graduation project aims at establishing Pyropower as a company in Europe, by developing a user-centric and innovative business case for near future as well as far future. The project will build a vision for Pyropower to look forward to and base company's decision on to. It would begin by understanding Pyropower as a company and values Pyropower believes in. Parallel to it, literature review of technology, market research, future forecasting will help in building the vision. The vision will help Pyropower in organisation of internal and external activities as well as in making decisions related to upcoming projects. User research, makes research, along with the vision will help in creating an initial business model. The initial business model will be suited to present context and will help Pyropower in implementing the technology as early as possible. Considering future context and vision, innovation strategy will be created which can be improvement in the business model with design of new product service combination or introduction of technology to a new market. A strategic roadmap and tactical roadmap will show necessary steps to be taken. The end result will be a clear vision for Pyropower, a business model blueprint, revenue model blueprint and innovation strategy with roadmap for coming few years which Pyropower can consider to develop the business in Europe.

Planning and approach

Include a Gantt Chart that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

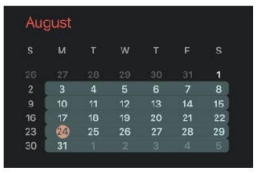


KICK OFF- 3RD AUGUST 2020

MIDTERM- 1st OCTOBER 2020

GREEN LIGHT- 17TH NOVEMBER 2020

THESIS PRESENTATION- 15TH DECEMBER 2020



A double diamond approach with ViP is used to approach the project. The project is divided into 7 main parts consisting Discovery, Define, Develop, Deliver, Green light, report and graduation. I plan to start the graduation on 3rd August, have the midterm on 2nd October, green light meeting on 20th November and thesis presentation on 18th December.

Discover phase includes exploration activities undertaken to learn more about context, about market, trends, technology, other companies working in the same field. It also includes user analysis in the form of interviews and company's internal analysis. This phase is followed by define phase which consists of analysing the data to define the problem/obstacles faced and identify the tension causing factors. A vision, value proposition is built to guide the next steps of design. In the develop phase, value networks are explored and built which helps to achieve the value proposition and future interactions and product/service concepts are explored for long term design vision. In the deliver phase, business models, revenue model blueprints are built which helps in achieving short term vision and strategic, tactical road-maps are built which help for achieving long term plan.

Motivation and personal ambitions

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed.

I have been working with the start-up for past one year on various areas such as product design, web design, business development etc. but I could not give sufficient time due to my engagements in other projects. This thesis gives me an opportunity to fully focus on the start-up and work on the things start-up is lacking. One of the main reason for me to work on the assignment is the fact that the vision that will be created will largely impact the start-up and through this project, I want to create that impact which will steer Pyropower towards designing for societal and transformational values. I plan to use my skills as a value designer and experience in clean technology sector to support the social ventures in India working in the field of clean technology.

Professionally, the project gives me the freedom to create something independently, which I am craving for quite some time. This project gives me an opportunity to further improve my skills as a strategic designer by practicing them in a professional setting. The project will give me an opportunity to experience and navigate through the uncertainty and thus will give me a chance to improve on the decision making skills. The limited time-line will force me to finish the project with a complete story. The project time-line will teach me to prioritize on the factors affecting the story and still, make a whole picture out of it.

I feel the courses I took during the masters program have prepared me for the project, a case where I have to combine the learnings from all the courses. I would like to test my skills as a strategic designer by working on the methodologies and structures taught during masters course, conduct a research, organize session and compile the insights to create a solution which gives an edge to the organization in a long run.

Another aspect that interests me is the role of transformational values in design of new products and services. I want to explore how to support the consumer's need of contributing to larger cause by developing suitable value chains and start working in the field of designing for values. Being responsible for the solution, with the initial uncertainty and tight time-line will put me in an uncomfortable situation but I look forward to the solution that will be developed and a convincing story that will be conveyed which will be more rewarding.

This project forms my first serious attempt at directing a start-up towards building a sustainable company, a company which does not follow consumerism but follows need based value creation. The project can form a start to my next step of working in the field of developing sustainable businesses in future. On a personal level, I will be able to present my views regarding sustainable development through this project which will help me in my next ventures.

Working in a company with chemical engineers, bio-systems engineers, mechanical engineers and users will give me an opportunity to consider different views and find the best solution possible. It will teach me to manage the expectations of different stakeholders while still being able to give the project a personal touch. Developing these skills through the project will most certainly prepare me for a future as a value designer.

Appendix 2

The chapter contains factors that are used for building the future context. These factors are collected from different sources and are divided into 4 main types- principles, developments, trends and state. The sectors explored to generate the context factors are related to psychology, culture, demography, sociology, biology, economy, technology, ecology, politics, evolution and agriculture. Overall, 113 factors were collected and presented here, with the clusters they are a part of. The factors are collected through literature research as well as from previous thesis. The related references are attached with the factors along with the reference to the thesis that was referred.

In the factor collection step, pieces of information about future are collected from literature and present, past context that will drive the generation of the future setting. Factor collection in the project leads to the development of a service and future direction for Pyropower. In the appendix, the factors are stated as a part of research whereas in the report, the future context stories they show are explained in the chapter of _____

The factors are organised using an online tool, airtable, which allows factors to be organised on a single platform. On the platform, the factors are organised using a title, description, reference and domain, where domain shows the sector a factor is a part of. The domain also distinguishes factors based on the nature of the factors, where factors are divided into types- principles, states, developments and trends.

The factors are presented with the clusters they are a part of, to make the connections between factors more visible, and make it convenient for reader to understand the clusters. The clusters will tell reader about the characteristics about the future context.

The ‘cape of good hope’ of Renewable future

Cluster 1

Demographic Development

Individuals contributing to climate change action

Individuals will contribute to climate change action by selecting sustainable choices. Individuals will have the responsibility to act against climate change and individuals, for the same, will support sustainable choices.

Reference- Fibieger Byskov M. (2019, Jan 11). Focusing on how individuals can stop climate change is very convenient for corporations. Fast Company. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository

Demographic State

Increased protest for climate change action

Millennials taking to protests all over the globe for urgent climate change action. Young and old together took to streets in almost 185 countries around the globe. Youngsters like Greta Thunberg are emerging as leaders as well. The overall message concerned powerful steps for climate change action to cut emissions and stabilise the climate.

Reference- Laville Sandra, Watts Jonathan (2019), Along the globe million join biggest climate protest ever, The guardian

Demographic Trends

People want to contribute to a larger goal through local actions

Business and governments have to think on systems level to solve issues. Establishments with best global and local networks of competencies around a particular issue will help businesses with competitive advantage.

Reference- Brand Reon, Rocchi Simona (2011), Rethinking value in a changing landscape, Philips design paper

Agricultural Trends

Farmers for sustainable energy production

Farmers sector in Netherlands is already successful in generating sustainable energy. More than 45% of energy in the sector of agriculture is already sustainably generated through wind turbines or firing biomass.

Reference- Korven Ton Ven, ZLTO, retrieved from https://www.zlto.nl/energie

Demographic Development

Change in social behaviour leading to less energy consumption

Consumers will insulate their houses, will walk, replace car by smaller one. companies will reorganise logistics, adopt product and processes. states will encourage renewable energy, less use of fossil fuels.

Reference- Hunkin Simon, Krell Katharina (2018), Behaviour change for energy efficiency, interreg Europe, European Union, European regional development fund, retrieved from https://www.interregeurope.eu/fileadmin/user_upload/plp_uploads/policy_briefs/PolicyBrief_Behavioural_Change.pdf

Ecology Trends

Growth of renewable energy in Europe

Europe will lead the energy transition still, it won't achieve the complete transition to renewable energy. The goal for Europe is to reach 30% of renewable energy by the end of 2030.

Reference- Adamowicz Jacub, Itkonen Anna-Kaisa, Bockstaller Nicole (2017), Renewables: Europe on track to reach its 20% target by 2020. retrieved from https://ec.europa.eu/commission/presscorner/detail/sl/MEMO_17_163

Ecology Trends

Dramatic events like climate change scenarios, fires, floods to increase

The number of climate related disasters tripled in the last 30 years. Every year, more than 20 million people are forced from their homes by climate change. The impact of climate change will be significant where nations will have to spend around 130 billion to 200 billion every year to manage climate change consequences.

Reference- Oxfam international (2020), 5 natural disasters that claim for climate action retrieved from https://www.oxfam.org/en/5-natural-disasters-beg-climate-action

Ecology Principle

Cities and energy sustainability

Earth charter cities are careful about the use of energy and develop and manage various ways of optimising earth's energy.

Reference- Straaten Gerben (2009), Earth Charter Manifesto

Social Principle

People are affected by the context they live in

every person is affected by the world the person is living in. Social and political decisions, influences in the end affect the person's family, school life and in the end, might shape his own identity.

Reference- Krauss Whitbourne S. (2019, May 17). The Surprising Truth About Perfectionism in Millennials retrieved from- Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository

Political Developments

Climate change plays major role in politics

"Global inequality is 25% higher than it would have been in a climate-stable world" climate change will lead the global politics to form groups and policies.

Reference- Beuret N. (2019, April 26). Global inequality is 25% higher than it would have been in a climate-stable world. The Conversation.

Psychological Developments

Collective can be held responsible for global problems

For globalised problems, collective can be held responsible, for an outcome and moral responsibility is not reducible to an individual of the member of the collective. This can produce backlash effect for people's perception of blame.

Reference- Downie, R. S. (1969). Collective responsibility. Philosophy, 44(167), 66-69

Bridging the gaps

Cluster 2

Psychological Developments

Science vs emotions- technology as strong and rational, emotions as soft and impulsive

In the current world, their is a tendency to consider technology as a strong and rational and emotions as a soft and impulsive. This creates an image of technology vs humanity in people's mind.

Reference- Kelly, K. (2010). What technology wants. Penguin. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository

Social State

Ethics or ambition?

Curiosity is taking over morality or ethical concerns. In fact, technology is measured with different measurements in different countries, making it unclear for people to practice self governance.

Reference- Ferro, G. E. M. (2017). Instinct, Habits, Workmanship, Idle Curiosity and Technological Progress: Prerequisite of Innovation. ECONÓMICAS CUC, 38(2), 113-120. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository

Technological State

Fearing the new technology

New technology runs the risk of harsh treatment by customers accustomed to the current technology.

Reference- Wüstenhagen, R., Wolsink, M., & Bürer, M. J. (2007). Social acceptance of renewable energy innovation: An introduction to the concept. Energy policy, 35(5), 2683-2691 Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository

Culture Development

Science for mankind

the topic of mankind and humanity is gaining value around the world. People are demanding for science to be focussing on humanities, governance etc.

Reference- Main S. (2019, May 1). The biggest government pledge to science spending for 40 years – but who benefits? The Guardian. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository

Culture Principle

Indestructible myths

When 'experts' try to unfold superstition or myth, it usually has a negative effect. The people, because of the new information and disruption of their worldview, feel threatened and so, reject the views of experts.

Reference- Malhotra S. (2019, Jun 7). Who Should Fight Superstition? The Wire: The Sciences. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository

Technological State

Democratisation of technology

4 areas- application development, data and analytics, design and knowledge are often referred to as 'citizen access' which led to citizen data scientists, programmer and more. This makes technology and its benefits accessible for consumers.

Reference- Cearley David (2020), Top 10 strategic trends for 2020, Gartner, retrieved from https://www.gartner.com/smarterwithgartner/gartner-top-strategic-technology-trends-for-2021/

Technological Trends

Local digital traffic handling

Data collection and delivery will be placed close to the source to decrease the digital traffic.

Reference- Cearley David (2020), Top 10 strategic trends for 2020, Gartner, p.8 retrieved from https://www.gartner.com/smarterwithgartner/gartner-top-strategic-technology-trends-for-2021/

Technological Development

Algocracy

Authority will be more and more embedded in the technology itself, or more specifically in the underlying code. There will be no need to orient people towards accepting rules as programming languages will have more control over bureaucracy and other fields.

Reference- A. Aneesh (2002), Technologically Coded Authority. Stanford University retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Technological Trends

Blockchain will be used in different sectors due to scalability

With the current developments in the field of blockchain, by 2023, blockchain will be a scalable technology and will support the trusted private transactions with necessary data confidentiality

Reference- Cearley David (2020), Top 10 strategic trends for 2020, Gartner, p.11

Technological State

Transparent and traceable technology

consumers are more aware about how their data is used by organisations and are using ai, machine learning to drive decisions, a trust crisis is emerged. To gain the trust, important 6 elements are - ethics, openness, integrity, competence, accountability and consistency.

Reference- Cearley David (2020), Top 10 strategic trends for 2020, Gartner, p.7

Social Development

Problem free life

People believe that technology can fix all the problems without them compromising/ changing any of their lifestyle. This idea supports individuals in keeping their habits and practices as they are, thinking that no radical change is needed to fix the world's problems.

Reference- Pacala, S., & Socolow, R. (2004). Stabilization wedges: solving the climate problem for the next 50 years with current technologies. science, 305(5686), 968-972 Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft

Technological Development

Short term innovation

The speed with which world is changing socially and economically is really high. Companies need to adapt to a highly competitive and disruptive environment. So, companies need to go for short term innovation to match the needs of rapidly changing world.

Reference- Satell G. (2017, Oct 15). Here's Why Your Organization Can't Handle Complexity. Inc.

Culture Principle

Mass personalisation

Users are more involved in the development process and need very specific solution suitable for their case.

Reference- Zheng, P., Yu, S., Wang, Y., Zhong, R. Y., & Xu, X. (2017). User- experience based product development for mass personalization: a case study. Procedia CIRP, 63, 2-7. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Technological State

AI security will be a big concern

By 2023, almost 30% of cyber attacks will consist of damaging the training data for ai system, manipulating the adverbial samples, AI model theft to attack the AI powered systems.

Reference- Cearley David (2020), Top 10 strategic trends for 2020, Gartner, p.12

Good riddance

Cluster 3

Political Development

Ambition to implement circular economy in Europe

Europe wants to recycle 55% of household waste by the end of 2030. This also includes recycling of 80% of wood packaging waste.

Reference-European Commission (2019), Review of waste policy and legislation, retrieved from https://ec.europa.eu/environment/waste/target review.htm

Political Trends

Transition towards decentralised energy generation

By 2050, almost half of EU households will generate energy for themselves and for the surrounding local community.

Reference- Ahmed Nafeez (2018), Decentralised microgridding can provide 90% of neighbourhoods energy needs, study finds, retrieved from https://www.vice.com/en/article/vbngmd/decentralized-microgridding-can-provide-90-of-a-neighborhoods-energy-needs-study-finds

Political State

Producer of the waste responsible for management of the waste and costs incurred for it.

The European policy of Extended Producer Responsibility talks about added responsibility for producers of waste to take care of the waste also. As of now, policymakers will hold producers responsible for waste production but in future, policymakers are trying to modulate the fees of ERP based on eco-friendliness of packaging.

Reference-Simon Frederic (2018), Brussels plans for new packaging rules to cut waste, retrieved from https://www.euractiv.com/section/circular-economy/news/fri-brussels-plans-new-eu-packaging-rules-to-cut-waste/

Economic Development

One planet economy

till date, economic growth is accompanied by unsustainable patterns of production and consumption which is the biggest cause of environmental degradation. The economic growth is resource dependent and we need to find out the ways to live in a more sustainable way. For that, there is a need to revolutionise business models.

Reference- Sabapathy John (2007), Sustainable consumption and production, University of Cambridge

Economic Trends

Challenging capitalism

Capitalism is under fire due to people's awareness about social, economical and environmental effectiveness. World economic forum released a manifesto for companies to focus on paying taxes, upholding human rights through out the supply chain, no corruption etc. Individuals, nations are supporting the idea of not damaging the planet and positive impact beyond profit.

Reference- top 10 sustainability trends to watch for in 2020 (2020), retreived from https://energywatch-inc.com/the-top-10-sustainability-trends-to-watch-in-2020/

Biological Principle

Waste is food for the biological system

The ability to reintroduce waste into biosphere in through non toxic, restorative materials is the base of the idea of circularity.

Reference- Ellen Macarthur Foundation (2013), Towards the circular economy, retrieved from https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf

Social Development

Collaboration and co-operation to successfully implement circular economy

Systems level thinking is needed for implementation of circular value chains. The actors in the system are more dependent on each other and face the consequences of the risk or benefits together.

Reference- Het Groene bein, circular economy, retrieved from https://hetgroenebrein.nl/

Economic Trends

Companies investing in 'refill' business models

Companies investing in areas that are not only related to recycling the waste, but they are looking at ways to completely eliminate the packaging from 'product' part. Companies will look at ways in which there will be no packaging, instead, the product will be refilled with the help of a delivery system.

Reference- Wilcox Meg (2020), 6 circular economy trends that will shape 2020, retrieved from https://www.greenbiz.com/article/6-circular-economy-trends-will-shape-2020

Ecology State

Initiatives to implement circular economy in synthetic fertiliser

In 2017, 712 million kg of nitrogen is imported in Netherlands for fertilisers and agricultural related use. 57% of the nitrogen leaves as an air pollution, food and soil.

Reference- Het Groene bein, circular economy, retrieved from https://hetgroenebrein.nl/

Economic Trends

Rise of service models for products

Companies investing in areas that are not only related to recycling the waste, but they are looking at ways to completely eliminate the packaging from 'product' part. Companies will look at ways in which there will be no packaging, instead, the product will be refilled with the help of a delivery system.

Reference- Wilcox Meg (2020), 6 circular economy trends that will shape 2020, retrieved from https://www.greenbiz.com/article/6-circular-economy-trends-will-shape-2020

Social Trends

Reduction in the use of primary raw material for production

Netherlands wants to decrease the use of primary raw materials by at least 50% by the end of 2030 than it uses today and change to a completely circular nation by the end of 2050.

Reference-Het Groene bein, circular economy, retrieved from https://hetgroenebrein.nl/

Technological Trends

Circular economy as a basis of development

Keeping resources in use as long as possible to extract maximum value from them. Consumer good companies are increasingly adopting circular strategies which include redesign of products, product as a service models etc. In addition to multi trillion dollar opportunity, circular economy plays important role in climate change, biodiversity loss, resource scarcity, waste and pollution.

Reference- Wijngaard Marinke, Circular economy as a basis for sustainable society retrieved from https://www.tno.nl/en/focus-areas/circular-economy-environment/roadmaps/circular-economy/?gclid=Cj0KCQjwuL_8BRCXARIsAGiC51BURTCuUh4XtW3i4ABwOB14RlkjNOyOcR14qv9P7JUKidRxL2Wf5PMaAq5vEALw_wcB

Strategic exploitation of agriculture

Cluster 4

Economic Principle

People always prefer a good today rather than in the future

When people are impatient, future services of durable goods are valued less than if they were available currently.

Reference- Allen Douglas (2007), Economic Principles: seven Ideas for thinking about almost anything, p.221

Social Developments

Production of food for health and human well-being

People will have more healthy and balanced diet available. Fresh and whole foods will be a trend and processing technology will produce foods with only minimal alterations to intrinsic qualities.

Reference- Niggli Urs, Slabe Anamarija, Schmid Otto, Halberg Niels, Schlüter Marco (2008), Vision for organic food and farming research agenda to 2025 ,International society of Organic Agricultural Research P.38

Technological Trends

Autonomous robots to do the mundane work

By 2023, over 30% of warehouse workers will be supplemented by collaborative workers. As the number of intelligent things increase, there will be a shift from individual autonomous robots to swarm of collaborative intelligent things.

Reference- Cearley David (2020), Top 10 strategic trends for 2020, Gartner, p.10

Technological Trends

Distributed clouds

By 2024, most cloud services will provide some form of service at the point of need. These clouds are distributed outside the physical data centres but are still controlled by technology provider.

Reference- Cearley David (2020), Top 10 strategic trends for 2020, Gartner, p.9

Technological Trends

People centric multi-touch point hyper automation

Technology is shifting scope from individual discrete tasks to knowledge works that drive more dynamic experiences. The technology will shift from single touch point to multi touchpoint interfaces like wearables and advanced computer sensors.

Reference- Cearley David (2020), Top 10 strategic trends for 2020, Gartner, p.3

Agricultural State

Artificial intelligence empowering agriculture

Companies using AI to identify bugs, diseases, to analyse data and genetically improve the seeds to increase yield, for irrigation purposes, to maximise land use etc.

Reference- Richard Van Hooijdonk (2018), The future of agriculture, retrieved from richardvanhooijdonk.com

Demographic Trends

Decreasing population in Europe

Southern part of Europe will see a rise in population whereas northern part of Europe will see a downfall in population.

Reference- Gaub Florence (2019) Global trends to 2030: challenges and choices for Europe, ESPAS p.10

Economic Trends

Favourable condition for trading globally and with neighbouring countries

Considering Netherlands, trade conflicts between US and china lead to large policy uncertainties. Even after that, global trade will still increase.

Reference- Gaub Florence (2019) Global trends to 2030: challenges and choices for Europe, ESPAS p.23

Economic State

Optimum use of land has been reached in Europe

80% of land in Europe is used for agricultural production, forestry or infrastructure.

Reference- European Environment Agency (2017, July 24). Land use. Environmental Topics.

Social Developments

Eco-functional intensification of food production

By 2025, the availability of food and stability of food supply will be considerably improved through economic intensification of food production. Knowledge among farmers about how to manage ecosystem services in sustainable way will be much greater, and animal welfare and environmentally sound farming will be cutting edge technologies in food production.

Reference- Niggli Urs, Slabe Anamarija, Schmid Otto, Halberg Niels, Schlüter Marco (2008), Vision for organic food and farming research agenda to 2025 ,International society of Organic Agricultural Research P.33

Agricultural State

Conscious efforts to increase productivity using nano and biotech

Scientist looking at how bio technology and nano technology can be used to improve the yield, grow food in marginal climate, reduce green house emissions.

Reference- Richard Van Hooijdonk (2018), The future of agriculture, retrieved from richardvanhooijdonk.com

Agricultural State

Traditional farmers looking for ways to improve productivity

Need for fertilisers will increase in future. In central Europe part, demand of fertilisers will be higher than the supply.

Reference- Richard Van Hooijdonk (2018), The future of agriculture, retrieved from richardvanhooijdonk.com

Agricultural Development

Organic agriculture increasing in Europe region

The number of organic farms has increased throughout Europe although they have relatively lower yields. The lower yields are compensated by higher costs. Health reasons, environmental concern are the main drivers behind the organic food consumption.

Reference- DG Agriculture and rural development (2019), Organic farming in the EU- A fast growing sector, retrieved from https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/market-brief-organic-farming-in-the-eu_mar2019_en.pdf

Agricultural Trends

New ways of farming to increase the production of food

New techniques such as vertical farming, fish and plant farming are being used for increasing food production due to their different benefits such as less pesticide use, affordable, higher yield, less diseases.

Reference- Richard Van Hooijdonk (2018), The future of agriculture, retrieved from richardvanhooijdonk.com

Enlightened older generation

Cluster 5

Economic Development

Income of people in Europe will increase

Europe will be the 3rd global economy by 2030 where Europe's GDP per capita is expected to increase from $37,800 to $50,950.

Reference- Gaub Florence (2019) Global trends to 2030: challenges and choices for Europe, ESPAS p.13

Demographic Trends

Aged richer and older human race in Europe

25% population in Europe will be over 65 by 2030 and the population will be characterised by expanding global class.

Reference- Gaub Florence (2019) Global trends to 2030: challenges and choices for Europe, ESPAS p.11

Demographic Trends

Work from home

As the workforce becomes more progressive, virtual tools will become a preferred mode of communication.

Reference- Gaub Florence (2019) Global trends to 2030: challenges and choices for Europe, ESPAS p.11

Economic Development

People in Netherlands are able to purchase more

Static purchasing power develops positively in 2020 as a result of policy and real wage increases.

Reference- CPB (2019), Macroeconomic outlook 2020, Netherlands Bureau for Economic Policy Analysis, p.2

Economic Principle

Maximisation

All individuals are always motivated by greed.

Reference- Allen Douglas (2007), Economic Principles: seven Ideas for thinking about almost anything, p.16

Economic Principle

Substitution

Everyone is willing to trade some amount of one good for some amount of other.

Reference- Allen Douglas (2007), Economic Principles: seven Ideas for thinking about almost anything, p.34

Social Trends

Sustainable consumption of items

One of the goals of United Nations is responsible consumption. People are concerned about the state of the planet and so, are being conscious about their behaviour and buying patterns and select a brand which suits their needs. It is an opportunity for the brands to connect with their consumers on the topic of healthy and sustainable living.

Reference- sustainable consumption facts and trends, World business council for sustainable development

Political Development

Moral populism

So called populist parties are increasing in Europe. These populist parties will have a strong moral component in future. In 2030, populist will merge with extreme right parties and bring back traditional morals.

Reference- Nacarino-Brabo A. (2019, March 2). Populismo: una cuestion moral. Letras Libres. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository

Economic Principle

Buyers are willing to pay higher prices for good proposition in case of competition between buyers

Inverse relation between the quantity demanded and good's price, other things held constant.

Reference- Allen Douglas (2007), Economic Principles: seven Ideas for thinking about almost anything, p.47

Economic Principle

Income of buyers, price of other goods and individual preferences play important role in demand of goods

The three exogenous parameters are income, price of other goods and tastes or preferences.

Reference- Allen Douglas (2007), Economic Principles: seven Ideas for thinking about almost anything, p.77

Social State

Large influence of value barriers

Value barrier plays a significant role in ethical consumption and consumer acceptance of a product.

Reference- Kushwah Shiksha, Dhir Amandeep, Sagar Mahim (2019), Understanding consumer resistance to the consumption of organic food. Food quality and preference 77 1-14

Economic Principle

People give away an item of lesser value for another item generating larger value for themselves

The maximum one is willing to sacrifice at the margin for a good, per unit time, declines the more one has of that good-other things held constant.

Reference- Allen Douglas (2007), Economic Principles: seven Ideas for thinking about almost anything, p.52

Economic Principle

Mutual voluntary trade involving values/profit for both parties

Mutual voluntary trade makes both parties better off.

Reference- Allen Douglas (2007), Economic Principles: seven Ideas for thinking about almost anything, p.41

Culture Principle

People will be more value aware

People become aware of their values hierarchy when forced to choose. “I could do this but it just doesn’t feel right”.

Reference- Culture Sensitive Design Lecture on Schwartz at TU Delft. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository

Small utopian cities of future

Cluster 6

Evolutionary Principle

Easily controllable small communities

Communities which are tightly held respond quickly in the time of crisis as they are aware of the steps needed to solve the crisis.

Reference- Aldrich, D. P. (2017, January). Trust deficit: Japanese communities and the challenge of rebuilding Tohoku. In Japan forum (Vol. 29, No. 1, pp. 39-52). Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Evolutionary | Principle

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Reference- Aldrich, D. P. (2017, January). Trust deficit: Japanese communities and the challenge of rebuilding Tohoku. In Japan forum (Vol. 29, No. 1, pp. 39-52). Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Political | Development

One nation

“The Enlightenment ideal of the nation as a single community, bound together by a common measurement framework, will be harder and harder to sustain. If you live in one of the towns in the Welsh valleys that was once dependent on steel manufacturing or mining for jobs, politicians talking of how “the economy” is “doing well” will likely to breed additional resentment”.

Reference- Davies W. (2017, January 19). How statistics lost their power -and why we should fear what comes next. The Guardian. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Social | Principle

Organisation and grouping

‘People organise themselves into grouping and organisations. When dismantling an old structure a new structure will come to place.’

Reference- Tajfel, H. (Ed.). (2010). Social identity and intergroup relations (Vol. 7). Cambridge University Press. Part I - Subchapter 3 The necessary and sufficient conditions for group formation. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Culture | State

Believing the peers

Knowledge transfer happens mostly through the experience of fellow students. Having a close relation to the topic increases the chances of believing the facts.

Reference- Damon, W. (1984). Peer education: The untapped potential, Journal of applied developmental psychology, 5(4), 331-343. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Psychology Principle

Framing society

Knowledge transfer happens mostly through the experience of fellow students. Having a close relation to the topic increases the chances of believing the facts.

Reference- Furnham, A. (2015). Young People's Understanding of Society (Routledge Revivals). Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Social Principle

Symphony of cities and other life forms

Earth charter cities maintains itself with respect for earth and life in all its diversity, it cares for all life forms and shows compassion and love. The city manages to use earth's resources carefully and contributes strongly to the intellectual, artistic, ethical and spiritual potential of humanity. The city ensures a democratic, sustainable society which also thinks about the future generations.

Reference- Straaten Gerben (2009), Earth Charter Manifesto

Culture Trends

Buying local

Millennial trend of buying local is being noticed by big as well as small brands. Consumers are prioritising environmental responsibility while helping local businesses thrive and reconnect with communities.

Reference- Euromonitor (2020), proudly local going global retrieved from https://blog.euromonitor.com/proudly-local-going-global/

Demographic Trends

Building local farming communities

Community support agriculture is still in development in Europe. CSA is a direct connection between producers and consumers of agricultural farms. CSA are small groups aimed at providing local and quality food in an environmentally friendly way. These movements are driven by young people who are open to innovation.

Reference- Volz Peter (2016), Overview of community supported agriculture in Europe, European CSA research group pp. 10

Societies on the edge

Cluster 7

Culture Development

People more aware of mental health

Leisure time is a must have and societies have developed a higher respect for leisure time and well being activities.

Reference- Ferring, D., Balducci, C., Burholt, V., Wenger, C., Thissen, F., Weber, G., & Hallberg, I. (2004). Life satisfaction of older people in six European countries: findings from the European study on adult well-being. European Journal of Ageing, 1(1), 15-25. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Biological Principle

Humans always need to know the outcome of their action

Humans brain needs certainty with every action otherwise a strong alert system is generated in the limbic system.

Reference- Rock D. (2009, Oct 25). A Hunger for Certainty. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Biological Principle

Memory at the base of human choices

Choice making in the human brain is based on the analysis of previous experiences. The brain identifies what is good or bad in a completely subjective way, in fact it is based on memory, culture and images.

Reference- Grusec, J. E. (1994). Social learning theory and developmental psychology: The legacies of Robert R. Sears and Albert Bandura.. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Psychological Principle

People's beliefs helping them to achieve certain psychological needs

Scientist show that people have motivated beliefs: beliefs that hold because they fulfil a psychological need.

Reference- Aldred J. (2019, Jun 6). 'Socialism for the Rich': the evils of bad economics. The Guardian - The Long Read.

Culture Principle

Value inhibition/enabling causes emotional tumultuousness.

People get emotional when the values they believe in are enabled or inhibited. These emotional responses can be used to identify what are the cultural values.

Reference- Roccas, S., Sagiv, L., Schwartz, S. H., & Knafo, A. (2002). The big five personality factors and personal values. Personality and social psychology bulletin, 28(6), 789-801. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Social Principle

Happiness also related to social comparison

People tend to compare their social status with others and the comparison plays a part in deciding the level of the happiness.

Reference- Galinsky, A., & Schweitzer, M. (2015). Friend & foe: When to cooperate, when to compete, and how to succeed at both. Crown Business. Pg 21. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Social Trends

Conflict of opinions

The phenomenon like Brexit and Donald Trump showed that there is contradiction between what political scientists feel is best for people and what people find valuable and meaningful.

Reference- Nacarino-Brabo A. (2019, March 2). Populismo: una cuestion moral. Letras Libres Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Culture Development

People keep on looking for happiness

People keep on looking for happiness but through different means. People keep searching for experiences that enrich them as individuals and through pursuing an amazing career.

Reference- Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success?. Psychological bulletin, 131(6), 803. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Culture Development

Truthing

Due to less trustworthy media and institutions, people are on the quest of finding the truth on their own with face to face interactions.

Reference- Bhargava R. (2019, March 8). 7 Non-Obvious Trends Changing The Future In 2019. Session at South by Southwest.

Culture Development

Social platforms for expression of feelings

'Shame' was one of the most used word on social platforms and this judging-moral characteristic is expected to increase. This will bring relevance to public debate only when people can have direct access to the discussion.

Reference- Scheff S. (2017, Dec 27). Was 2017 the Rise of Online Shaming? Huffpost. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Social Trends

More social shares- more truthful

News are validated by the shares and not by the truthfulness of the stories. What matters is if the story is going around or not.

Reference- Meyer R. (2018, March 8). The Grim Conclusion of the Largest- ever Study of Fake News. The Atlantic. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Culture State

Public executions with digital platforms

Were common in Europe until the late 19th century. These were celebratory events. Such events let people feel superior. This happens now in the digital world, where public matters are brought to the attention of the public for everyone to cheer or criticise in a 'digital square'.

Reference- History TV - Shows (2016). Execution in the Middle Ages. Tv Show - Documentary. History Today. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Culture Developments

Fear of missing out

People do not want to be missing out on things their peers are experiencing, having, doing etc.

Reference- Barker Eric (2016), This is the best way to overcome the fear of missing out.

Culture Developments

Freedom of choice increases happiness

Humans have one quality that separates them from other animals- freedom of choice, subject only to social and cultural factors; and that human ingenuity and problem solving shows cumulative progression that can continue to expand over the time. It is generally accepted that freedom of choice increases happiness.

Reference- Verme Paolo (2009), happiness, freedom and control, Journal of Economic Behavior & Organization 71 (2009) 146–161.

Meaningful desires

Cluster 8

Culture Trends

Consumers returning to premium

Consumers will favour quality, convenience and healthfulness over pure price, particularly in meat segment

Reference- Danzinger P.N. (2019, January 13). 6 Global Consumer Trends For 2019, And The Brands That Are Out In Front Of Them, Forbes, Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Technological Development

Products having meaning

Science and social are not considered as 2 different sides of spheres, but both go hand in hand. This leads to design of products which have meaning and value associated to it.

Reference- Fromm J. (2019, Jan 16))Purpose Series: A Purpose-Driven Brand Is A Successful Brand, Forbes, Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Demographic Trends

Meaningful connections is the future of social

In 2020, people will be looking for small and more intimate communities rather than the current vast toxic online communities. They will like to be in touch with people who actually share the same interest as them. The goal of the community will be to make the connections that really enhance the quality of life, create and support the connections that truly matter.

Reference- trendwatching (2020), 5 trends for 2020, retrieved from https://trendwatching.com/quarterly/2019-11/5-trends-2020/#civil-media

Demographic State

Consumers are attracted towards altruistic nature of products

Government and policymakers should focus their efforts towards the growing communities of ethically consuming people.

Reference- Kushwah Shiksha, Dhir Amandeep, Sagar Mahim (2019), Understanding consumer resistance to the consumption of organic food. Food quality and preference 77 1-14

Social Principle

People need authenticity with products

People are looking for a specific cues/characteristics within the product which help fulfil their identity desires such as control, virtue.

Reference- Beverland, M. B., & Farrelly, F. J. (2009). The quest for authenticity in consumption: Consumers' purposive choice of authentic cues to shape experienced outcomes. Journal of Consumer Research, 36(5), 838- 856.

Social Trends

Companies making conscious efforts to develop all inclusive proposition

Google is publishing 53 new gender fluid emojis called gender inclusive emojis. Furthermore, conscious efforts will be taken to give full freedom of expression without discriminating personal inclinations.

Reference- England J. (2019, May 8). Google is releasing 53 new gender neutral emojis. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Demographic Development

Shorter attention span and more filtering power

The average attention span of goldfish is 9 sec. and as per new studies by Microsoft, people loose concentration after 8 sec. The lower attention span may be a side effect of evolving brain's ability to mobile internet.

Reference- Kevin Mcspadden (2015), You now have shorter attention span than goldfish, retrieved from https://time.com/3858309/attention-spans-goldfish/

Social | Principle

Latent needs of people

People do not understand their needs until they see the options in the context.

Reference- Perugini, M., & Bagozzi, R. P. (2004). The distinction between desires and intentions. European Journal of Social Psychology, 34(1), 69-84. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Economic | Development

Brands need to connect emotionally with consumer and appeal accordingly

Brand storytelling is a narrative which weaves and creates emotions and values the brand stands for. Rather than focussing on selling the product, companies will focus on telling why the story matters and capitalise on the market the story is compelling for.

Reference- De Costa C. (2019, Jan 31). 3 Reasons Why Brand Storytelling Is The Future Of Marketing. Forbes

Biological | Principle

Stories influencing multiple parts within brain

When listening to stories, brain is activated within language processing part as well as other areas needed for experiencing the story.

Reference- Grusec, J. E. (1994). Social learning theory and developmental psychology: The legacies of Robert R. Sears and Albert Bandura. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Economic | Development

Social platforms for originality of businesses

Development of social platforms has helped businesses to show their originality directly to their customers along with constant touch and instant feedback from the customers.

Reference- Lee S. (2017, Dec 29). Picture Perfect? How Instagram changed the food we eat. BBC News. Retrieved from Costanza Milano (2019), Social mobility Europe 2030, TU Delft repository.

Appendix 3

The 12 practices that evolve from the combination of clusters are mentioned in this chapter. The practices are formulated from the intersection of cluster from one group with the other cluster from the other group. The practices here are the different possible settings in the future, each showing a different aspect of future which Pyropower or any other company wishing to contribute to communities in agriculture can consider to design their value propositions and decide the direction.

Small utopian cities | Bridging the gap | Bridging the gap

Getting your hands dirty

People want to actively participate in building the local community, a community which thrives on itself, is lawful and closely connected. The community takes cautious steps with development and is ready to react to the context immediately. People are aware of their well-being and will take steps to ensure a just society which brings them happiness. People will be quick to take decisions among themselves and will adhere to the decisions taken by community. On the other hand, rise of fragmented governments and context-dependent concept interaction will ask for increased interactions between communities and governance bodies as well as within communities.

Small utopian cities | Bridging the gap | Strategic exploitation

Individual ambitions

There will be opportunities for people to contribute to in the society and with other societies. Contributors will make use of traditional as well as modern technology to develop solutions that serve their community and if needed, adjacent communities too. When the traditional farming will support the local communities, people will take on other opportunities by intensifying farming methods to support the need of the other communities and world.

Small utopian cities | Bridging the gap | Enlightened older generation

New teachers

The future communities will consist of older and wiser generation, capable of spending more money on things that create value for them and society. The community looks at different parameters before buying a proposition and supports leaders that take the perspective of people rather than elite group. The community will ask for propositions that aren't price dependent rather support the community along with individual benefit.

Small utopian cities | Bridging the gap | Meaningful desires

My opinion...

The citizens in local communities are driven by creating a meaning to the lives rather than materialism. They are attracted towards propositions and brands that are transparent and the brands that believe in a story. On a bigger level, communities will collaborate with organisations that not only generate value but also take a moral stand in society and are transparent and authentic in doing that. They will be attracted to brands that listen to their consumers and incorporate their recommendations.

Cape of good hope | Bridging the gap | Society on the edge

Renewable movement

People will be facing more climate change related scenarios and will see more radical changes from individuals for climate change action. They will make changes to their lifestyle so as to reduce the impact on environment and will be looking for solutions and propositions which make possible these changes. People will want to select propositions which motivate them to make small changes to their lifestyle to have a bigger impact on the outside world. Organisations, governments will nudge the people with suitable propositions to promote sustainable activities and support climate action.

Cape of good hope | Bridging the gap | Strategic exploitation

Green, but Business

Companies will identify the gap between people's need of supporting climate change action and existing propositions and will want to capitalise on the opportunity. Companies will think about different ways to exploit the growing need of renewable energy at a feasible cost.

Cape of good hope | Bridging the gap | Enlightened older generation

Renewable nudges

I can choose more sustainable and renewable choices, if they are really creating a value for me and the society.
The older generation wants to support the climate change action in ways that are suitable for them. Just like the generation z, older generation is also affected in the same way due to climate change and although they prefer convenience in life, they will be ready to spend more on renewable choices but only if the proposition creates a value for them and society. Organisations will have to think about how to create value for older generation, in ways that they will find useful.

Cape of good hope | Bridging the gap | Meaningful desires

Truthful renewability

We will see organisations appealing the consumers based on a story they believe in and considering the increasing awareness about climate change, people will be more attracted towards propositions that consider renewability as a solution. The people will look for propositions that are novel to their case and help them fulfil their psychological desires.

Good riddance | Bridging the gap | Society on the edge

Circular lifestyle

People will want to be the ideal citizen of a community, due to the motivation to act against climate change or due to the fear of social consequences, in every possible way. As planned, Europe wants to recycle the 55% of waste by 2025 which gives people motivation as well as timeline to follow, which also forces them towards circularity. People will be enthusiastic about the new propositions, given that they add to the convenience and provide a way to fulfil the psychological need to be happy by supporting the movement of climate change action. They will look at possible collaborations themselves to collectively act against the waste production.

Good riddance | Bridging the gap | Strategic exploitation

Waste as a revenue source

The organisations will look at the opportunity of circularity as a way to introduce new products as well as services in the market. People will ask for solutions that are hassle free to operate as well as take care of waste in a circular way. Waste becomes another resource for people to support climate change action while earning at the same time.

Good riddance | Bridging the gap | Enlightened older generation

Attractive transitions

The older generation will see the transition of the business models and will be able to understand the change in the values offered and choose accordingly. They will experience the transition from current way of waste management to the new way of waste management and it will be challenge for solutions providers to make the transition attractive as people tend to get comfortable with the current way of living. Accordingly, newer policies, incentives could be seen in future to support the grass root level transition to circularity.

Good riddance | Bridging the gap | Meaningful desires

One extra step

People will build small communities among themselves to take care of communal waste with collaborations with organisations. It is possible that people will take the extra effort to gain the satisfaction of doing good in the community. Accordingly, it will not be about managing the waste only, it will be about feeling good by managing the waste and organisations will try to fulfil this desire of the people in a community.

Appendix 4

Introduction-

This interview is a part of my thesis research phase. As you know, I am doing my thesis with Pyropower and I am developing a strategy for Pyropower to introduce a product in European market. Also, Pyropower needs a long term vision to look forward to and subsequent roadmaps, strategies to achieve the same. So, I am interviewing people from Pyropower to understand what Pyropower really is, what was the idea, inspiration behind Pyropower through your eyes. Before starting with the interview, I would like to tell you that I will be using results of this interview for my thesis and the interview will be available to the public but your identity will remain anonymous. I have sent you a document concerning the same, please sign it and revert. Total duration of the interview is somewhere around 40-60 minutes and during the interview, feel free to interrupt and ask questions if you feel like. For the interview, we will start with your past experience, work and upbringing (to understand what led you to this field of agro innovation), then we will talk about past of Pyropower, how it was established, how you guys met etc. then we will talk about present of Pyropower, the reason behind it's projects, collaborations etc. and then we will dive in the future, talking about your expectations from Pyropower, where do you see Pyropower in the future etc. the interview will be recorded for further use.

1.Past Experiences- About yourself- what do you do, where you are from, upbringing, education, why this side, what do you like? Connection with agriculture or energy

2.Pyropower past-

1. Story behind Pyropower?
2. How was team formed? How did you get in touch? What was the connection?
3. Initial competition ideas, team formation, work you did
4. Dreams back then, what were your expectations from Pyropower, what values Pyropower believes in?
5. Project start and development, business models etc.

3. Pyropower present-

1. What is happening in all these projects currently?
2. What is the idea behind Europe market introduction? Why was it conceived?
3. What is it that Pyropower wants to achieve through this project?
4. Team division?
5. Current collaborations? Business models
6. Current problems that you think startup is facing? Technology wise, business wise

4. Pyropower Future

1. What is your vision for Pyropower? Where do you want to see the startup going?
2. What do you see the startup as? Is is all about agriculture? Is it all about energy? Developed countries? Developing countries? What can be the USP of the firm?

Introduction-

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1.Past experiences- About yourself- what do you do, where you are from, upbringing, education, why this side, what do you like? Connection with agri culture or energy

2.Story of Pyropower-

1. Story behind pyropower integration
2. Why pyropower and biochar association
3. Views on biochar technology of pyropower
4. Problems currently pyropower is facing
5. Overall problems with biochar technology

3.Future of pyropower

1. What are your expectations from pyropower
2. What are the things wageningen can work on? Regarding biochar
3. Your experience in the field of assessing soil health

1. About the farm
    1. History of the farm- since how long have you been farming?
    2. Plantation, ownership, government provided
    3. How big is it? How many people handle it? Whats the work that happens?
    4. Livestock?

2. Organic farming
    1. Fertilisers?
    2. Organic fertilisers?
    3. Quantity and how frequently?
    4. Organic/inorganic, cost yearly/monthly
    5. Consultation for fertilisers- government support? Wageningen university?
    6. Why? Why not consultation if yes, how much consultation costs and all
    7. Govt. involved in any of the activities? What activities and what support?
    8. Animal manure?
    9. Soil productivity increased? How do you know?
    10. Where do you assess soil? Can you tell about the findings? How often do you do that?
    11. Are you a part of any organisation which helps you? In what activities do they help?
    12. Where do you sell the products? Veggies or whatever? What happens with the waste?

3. Future plans-
    1. Future plans with the field?
    2. Planning for completely organic farming?
    3. What support you wish you had? Considering consultation or organic farming?
    4. Do you plan to increase investment in any of the activities on farm?
    5. Do you anything about biochar?
    6. Views about other non-organic farms

Appendix 5

Estimates

1. Microsoft Azure

Microsoft Azure Estimate					
Your Estimate					
Service type	Custom name	Region	Description	Estimated monthly cost	Estimated upfront cost
Cloud Services		West Europe	1 D2 v3 (2 Core(s), 8 GB RAM), 1 year reserved	US$ 0.00	US$ 1,475.88
Storage Accounts		West Europe	Block Blob Storage, General Purpose V2, LRS Redundancy, Hot Access Tier, 30 TB Capacity - Pay as you go, 100,000 Write operations, 100,000 List and Create Container Operations, 100,000 Read operations, 100,000 Archive High Priority Read, 1 Other operations. 1,000 GB Data Retrieval, 1,000 GB Archive High Priority Retrieval, 1,000 GB Data Write	US$ 603.24	US$ 0.00
Application Gateway		East US	Basic tier, Small Instance size: 0 Gateway hours instance(s) x 730 Hours, 0 GB Data processed unit(s), 5 GB Zone unit(s)	US$ 0.00	US$ 0.00
Azure Machine Learning		East US 2	Basic, 1 D3 v2 (4 Core(s), 14 GB RAM) x 730 Hours, Pay as you go	US$ 167.17	US$ 0.00
Support			Support	US$ 0.00	US$ 0.00
			Licensing Program	Microsoft Online Services Agreement	
			Total	US$ 770.41	US$ 1,475.88
Disclaimer					
All prices shown are in US Dollar ($). This is a summary estimate, not a quote. For up to date pricing information please visit https://azure.microsoft.com/pricing/calculator/					
This estimate was created at 1/9/2021 2:44:55 PM UTC.					

2. IT consultancy and design

ATTRACT GROUP
Your Trusted IT Partner

Project sample

Proposal for responsive web frontend development

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INTRODUCTION

Our mission is to help new businesses start and emerge faster and accelerate global business digitalization.

The custom mobile projects development is our main specialization. We develop and support software solutions for 20+ startups. So, we're a perfect fit to implement and support your idea.

Methodology

It's Agile age now. All our managers use Scrum methodology for all the project that we work on:

- 2-week sprints;
- daily meetings, backlog refinement, sprint retrospective - all these meetings are utilized.

Warranty

We always do our best to deliver high-quality software that will foster your business. As a guarantee of our work - after the project has been completed, we give you a 3-month warranty. This means 3 months of any bug fixing for free*.
* applied if only Attract Group developers change the project's source code.

Payments

We propose several payment options. Please choose the most suitable one for you:

- a contract with the US-based company. All payments should go to the US bank account;
- a contract with the Ukrainian based company. All payments should go to the Ukrainian bank account.

ESTIMATION AND BUDGET

Based on the specifications and wireframes the following time/cost estimate has been prepared. The rows in yellow - we need to have all the source code to prove those hours.

#	Task/Module	Deliverables / Comments	Hours
UI/UX design			
	Design stage		16
Frontend			
	October CMS research		12
	Project initiating		8
	Theme investigation		4
	Project investigation		8
	Home page		12
	Search result		8
	Item page		16
	Messages		12
	Post item		6
	Feed		12
	Account		6
	Profile (shop)		8
	Profile (edit-shop)		6
	About		6
	Sign in / Sign up		2
	University page		8
QA manual Testing			
	Manual testing		40
THE SUMMARY (hours):			
UI/UX design			16
Frontend			134
QA manual testing:			40

To obtain an approximate budget, the hourly rates are:

Service	Cost per hour
UI/UX design	$30

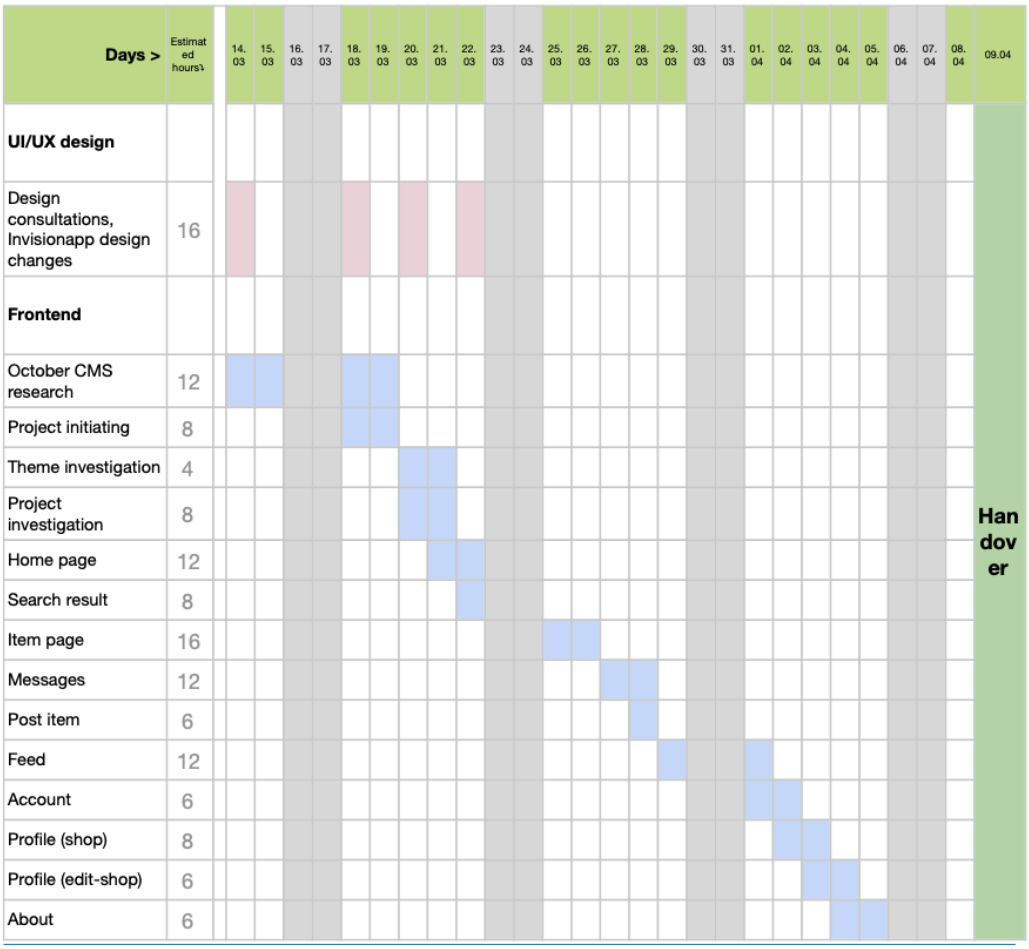
Frontend	$
QA manual testing:	$15
Project part	**Budget**
UI/UX design	$480
Frontend	$4 020
QA manual testing:	$600
TOTAL:	**$5 100**

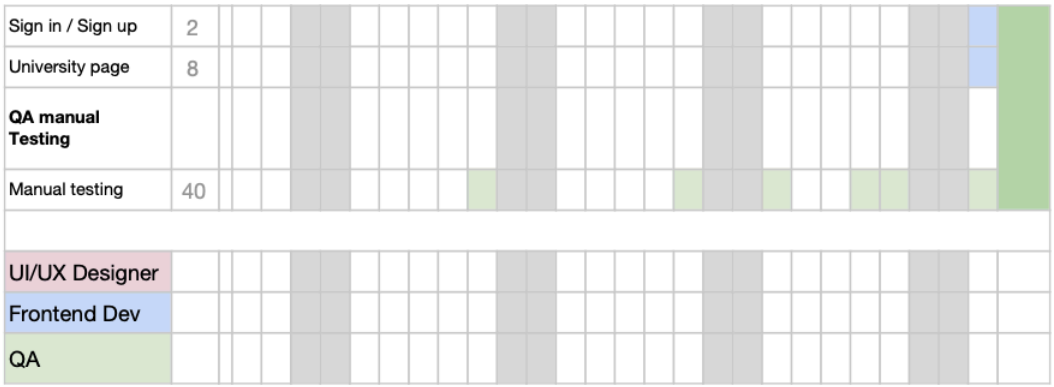
As a result, the website will be fully responsible for all modern browsers and OS.

Please let us know if you'll have any questions.

ROADMAP

Based on estimated hours amount and team composition the following roadmap should be expected:





Based on the current roadmap we could expect all the functionality to be developed and tested within 4 weeks from the kickoff date.

TEAM COMPOSITION

We're planning to involve the following teammates for an active development stage:

- 1 Project manager (4+ years experience, 20+ successful project released);
- 1 UI/UX designer;
- 1 Frontend developer;
- 1 UI/UX designer part-time;
- 1 QA testing engineer.

THE NEXT STEPS

Please review this document and let's arrange a Skype/Zoom meeting to discuss it.

If you need to get more information about our experience - let us know and we'll share our past works. To check our clients' testimonials please use the following links:

- Clutch: https://clutch.co/profile/attract-group#reviews
- GoodFirms: https://www.goodfirms.co/companies/view/4408/attract-group

Appendix 6

3.2.1.4 Applications of biochar

The biochar has several applications which can be classified into 8 main sectors-
1. Animal farming
2. Soil amendment and agriculture related
3. Construction industry
4. Water treatment
5. Treatment of waste water
6. Treatment of drinking water
7. Divers other use
8. Textiles and wellbeing

Animal farming- use of biochar as a regular feed supplement since long time (earlier charcoal, now biochar) to treat acute medical conditions. As the biochar passes through the digestive track of animals, it gets enriched with nitrogen and other nutrients. So, when it leaves the digestive track, it becomes more valuable organic substance causing less nutrient loss. In the end, the biochar gets mixed with soil, by getting mixed with compost or manure. The regulations around using biochar as a feed supplement are different to ensure no dosage of heavy metals to animals. In rare cases, negative effects were found which may limit the long term dosage of biochar to livestock (Schmidt, 2019).

Construction industry- biochar can be added to the construction material or can be applied with plaster on the outer walls upto a thickness of 20 cm. Such walls help with adsorbing smells and toxins and with many other things such as noise reduction, deodorant etc. while still being a carbon sink to store carbon from environment. As the house is demolished, the plaster containing biochar is mixed with soil, thus enhancing soil productivity. (Schmidt, 2020)

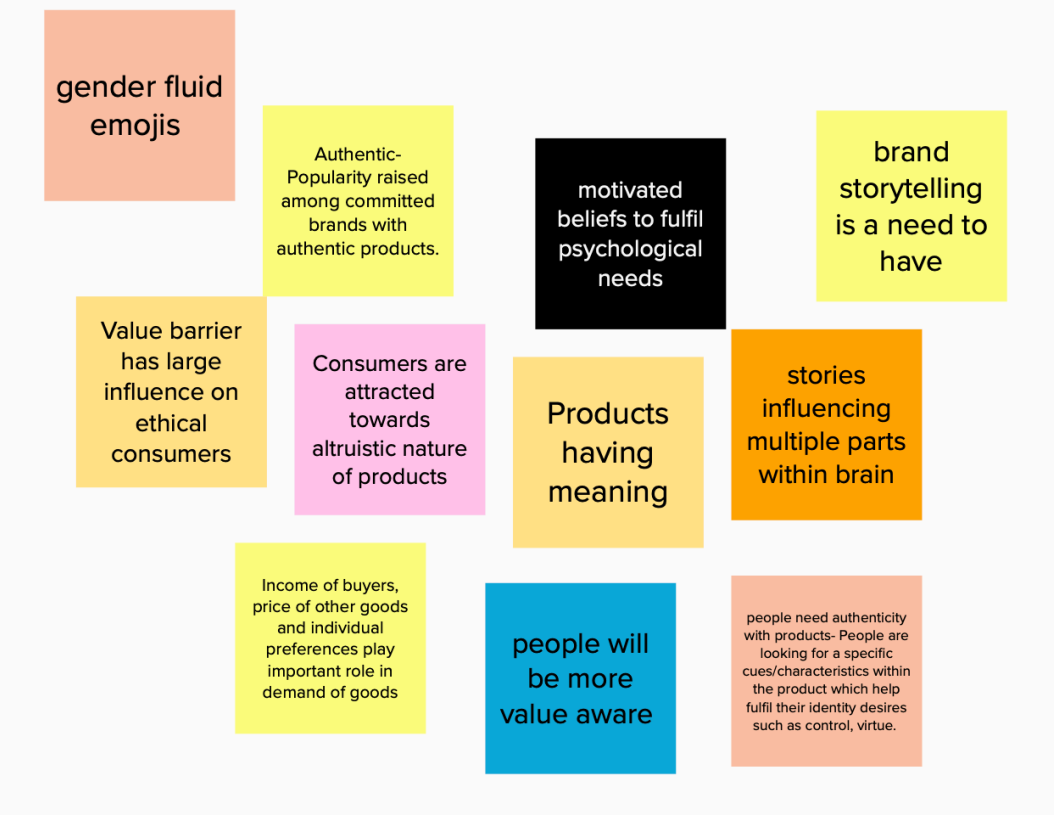
Water industry- biochar, due to its porous structure, can be used for water treatment related applications. Biochar is known to be an adsorbent with high adsorbing capacity, however, detailed understanding of different mechanisms governing adsorption process are still lacking. Since the properties of biochar depend a lot on initial biomass, more studies are needed to tailor the biochar for a specific water treatment related job. Also, studies have shown that with increasing number of cycles, the biochar stability is decreased, and carbon is released from biochar, which can increase the carbon content and sometimes, heavy metals in the solution to be treated. (Enaime, 2020)

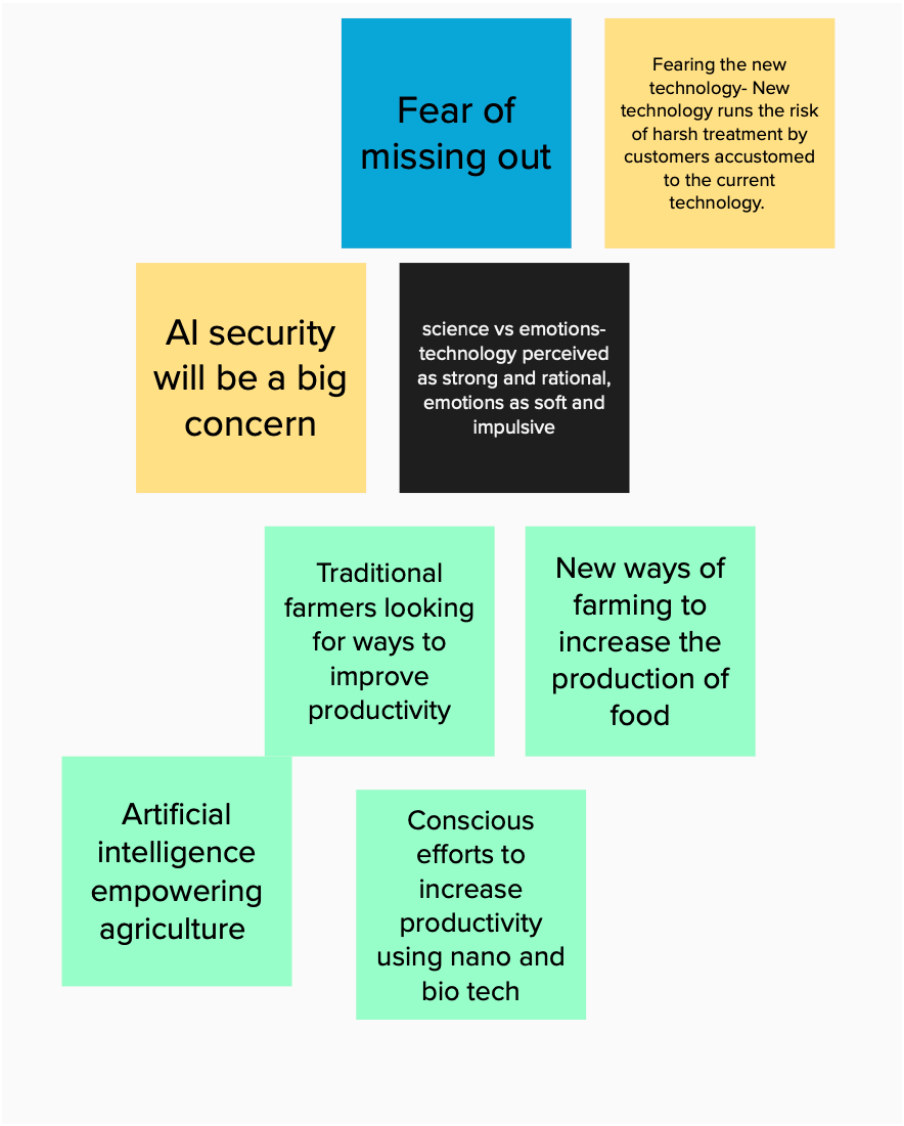
Textiles and wellbeing- Due to the adsorbing capacities of biochar, it is used as a filling material for pillows and mattresses. The biochar is also reflects heat which provides a comfortable sleep while reducing neck tension. In China and Japan, people are already using bamboo for producing biochar and fabric. The fabric provides better ventilation, reduces development of odour through sweat.

Other uses- woody and non woody biochar can be used for producing direct carbon fuel cells. However, the major challenging issue for understanding is the mechanism of electrochemical reaction kinetics and carbon oxidation at anode/electrolyte surface. More research is needed before it is applied in practical cells (Jafri, 2019). On the other hand, huge amount of money is being spent on hydrogen fuel cell, which are believed to be a replacement for transitional fuel cells.

Appendix 7

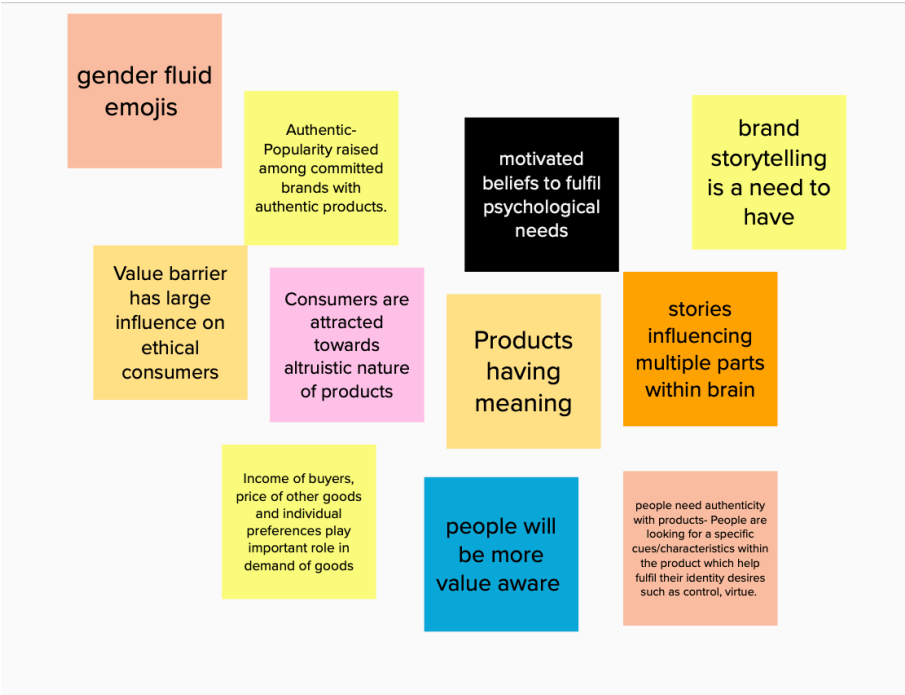
Participant 1



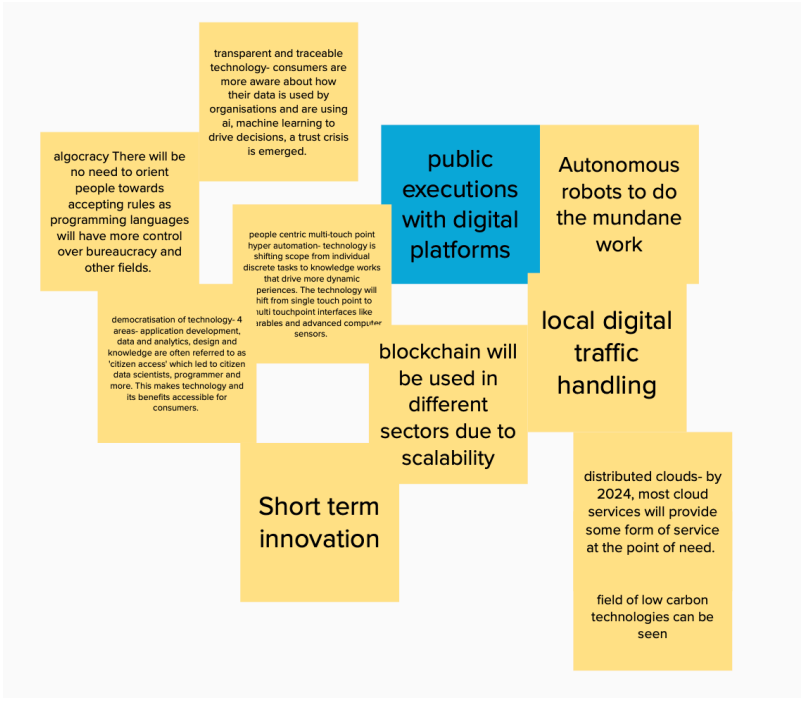

Fear of missing out
Fearing the new technology- New technology runs the risk of harsh treatment by customers accustomed to the current technology.
AI security will be a big concern
science vs emotions- technology perceived as strong and rational, emotions as soft and impulsive
Traditional farmers looking for ways to improve productivity
New ways of farming to increase the production of food
Artificial intelligence empowering agriculture
Conscious efforts to increase productivity using nano and bio tech

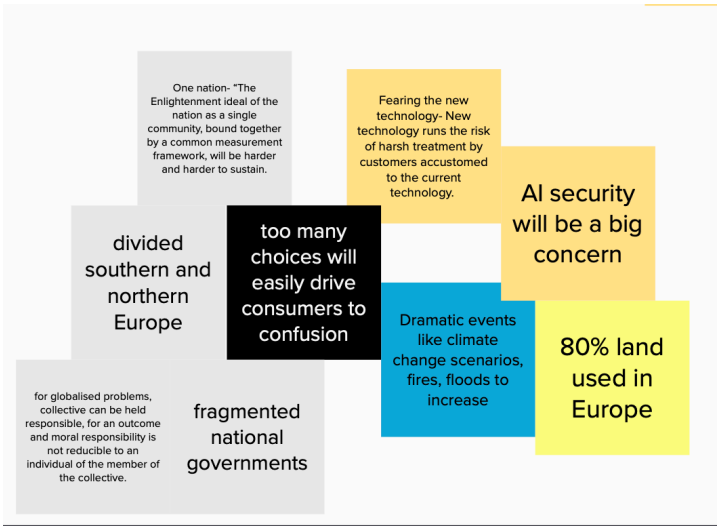

One nation- "The Enlightenment ideal of the nation as a single community, bound together by a common measurement framework, will be harder and harder to sustain.
Favourable condition for trading globally and with neighbouring countries
Truthing- Due to less trustworthy media and institutions, people are on the quest of finding the truth on their own with face to face interactions.
freedom of choice increases happiness
social platforms for expression of feelings
Fear of missing out
Fearing the new technology- New technology runs the risk of harsh treatment by customers accustomed to the current technology.
people are affected by the context they live in
Indestructible myths- The people, because of the new information and disruption of their worldview, feel threatened and so, reject the views of experts.
moral populism
buying local
public executions with digital platforms
people more aware of mental health
building local farming communities
divided southern and northern Europe

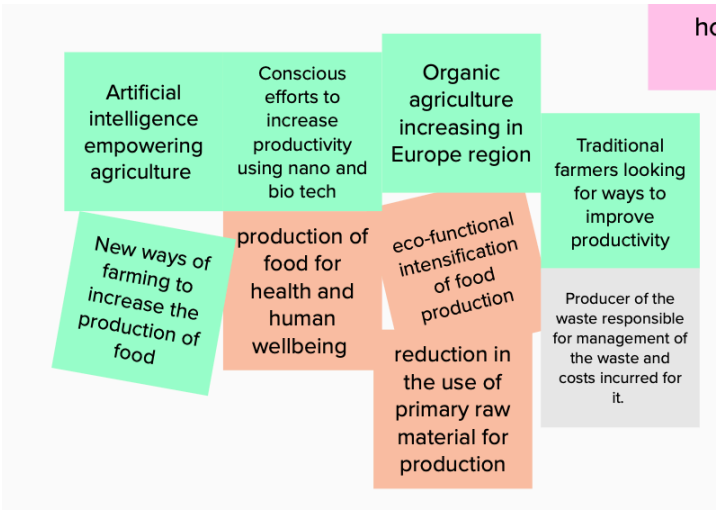

support to sustainable choices
climate change plays major role- climate change will lead the global politics to form groups and policies.
disruptions in the field of fossil fuels- Rapid acceleration in the field of low carbon technologies can be seen
symphony of cities and other life forms- earth charter cities maintains itself with respect for earth and life in all its diversity, it cares for all life forms and shows compassion and love.
Income of buyers, price of other goods and individual preferences play important role in demand of goods
Cities and energy sustainability
increased protests for climate change
empowerment of rural areas and economies
Growth of renewable energy in Europe
Farmers for sustainable energy production
People need to detach themselves from the past unsustainable activities- Psychology will help people to detach themselves piece by piece from their unsustainable choices
Circular economy as a basis of development
Dramatic events like climate change scenarios, fires, floods to increase

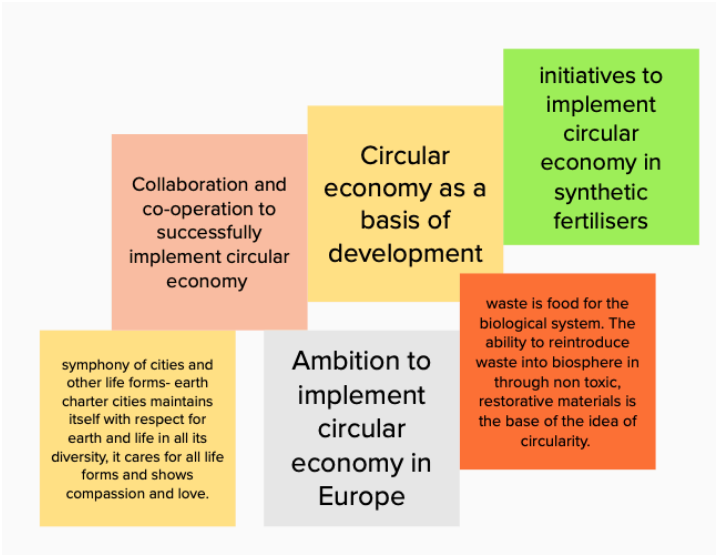

gender fluid emojis
Authentic- Popularity raised among committed brands with authentic products.
motivated beliefs to fulfil psychological needs
brand storytelling is a need to have
Value barrier has large influence on ethical consumers
Consumers are attracted towards altruistic nature of products
Products having meaning
stories influencing multiple parts within brain
Income of buyers, price of other goods and individual preferences play important role in demand of goods
people will be more value aware
people need authenticity with products- People are looking for a specific cues/characteristics within the product which help fulfil their identity desires such as control, virtue.

Participant 2

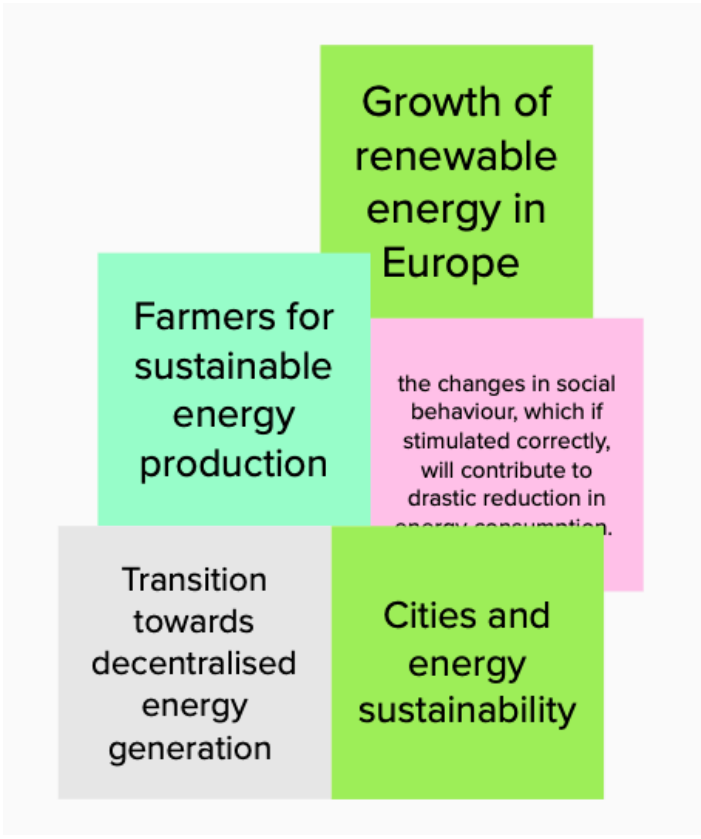


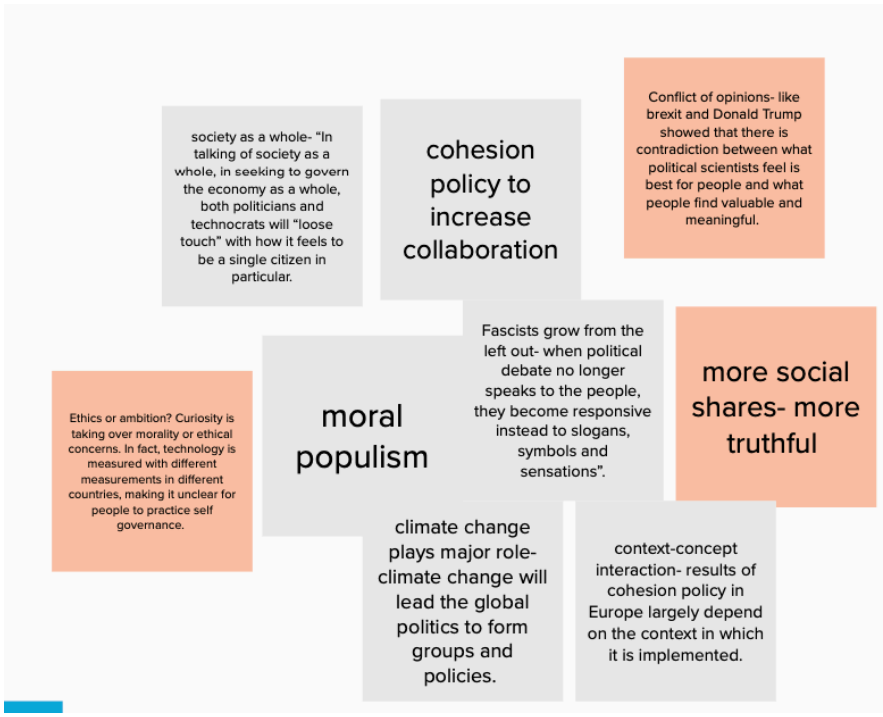

One nation- "The Enlightenment ideal of the nation as a single community, bound together by a common measurement framework, will be harder and harder to sustain.
Fearing the new technology- New technology runs the risk of harsh treatment by customers accustomed to the current technology.
AI security will be a big concern
divided southern and northern Europe
too many choices will easily drive consumers to confusion
Dramatic events like climate change scenarios, fires, floods to increase
80% land used in Europe
for globalised problems, collective can be held responsible, for an outcome and moral responsibility is not reducible to an individual of the member of the collective.
fragmented national governments

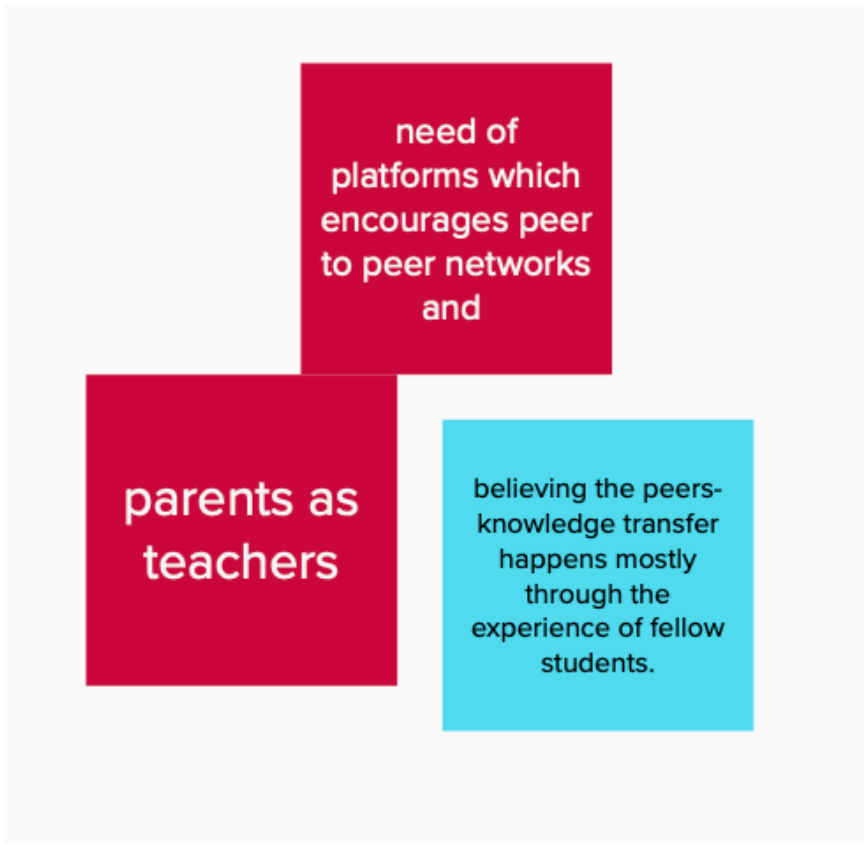

Artificial intelligence empowering agriculture
Conscious efforts to increase productivity using nano and bio tech
Organic agriculture increasing in Europe region
Traditional farmers looking for ways to improve productivity
New ways of farming to increase the production of food
production of food for health and human wellbeing
eco-functional intensification of food production
Producer of the waste responsible for management of the waste and costs incurred for it.
reduction in the use of primary raw material for production

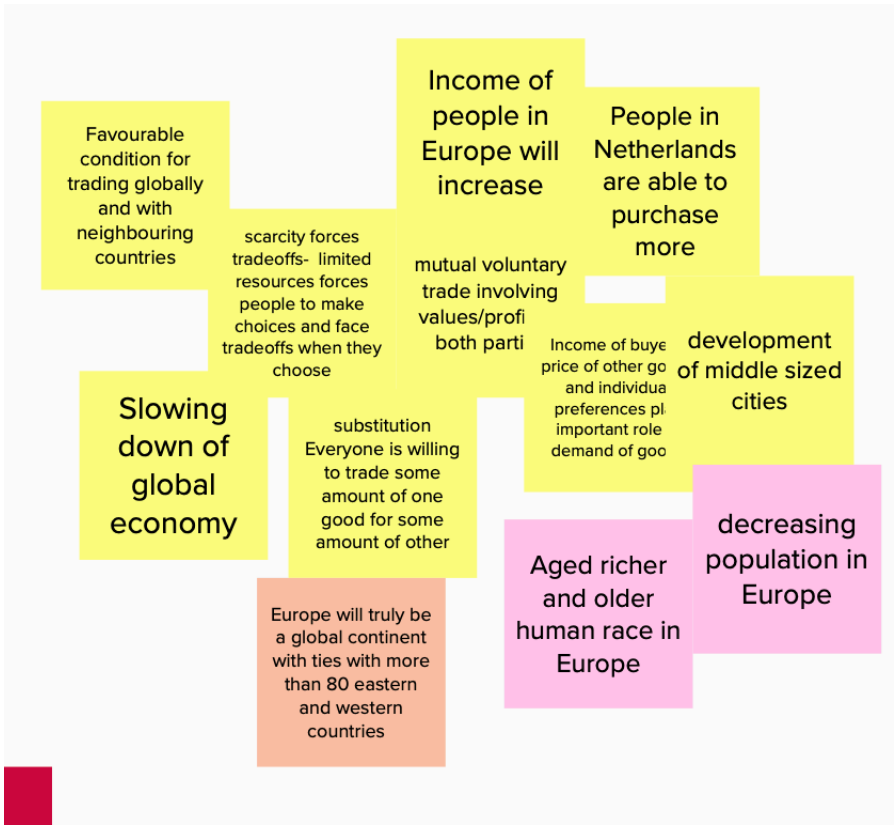

initiatives to implement circular economy in synthetic fertilisers
Collaboration and co-operation to successfully implement circular economy
Circular economy as a basis of development
waste is food for the biological system. The ability to reintroduce waste into biosphere in through non toxic, restorative materials is the base of the idea of circularity.
symphony of cities and other life forms- earth charter cities maintains itself with respect for earth and life in all its diversity, it cares for all life forms and shows compassion and love.
Ambition to implement circular economy in Europe

Participant 2

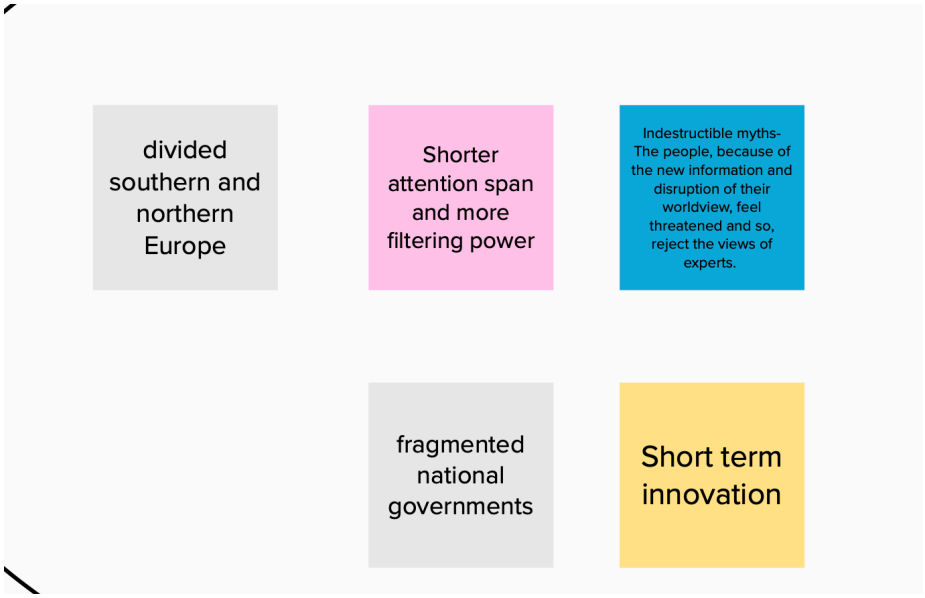


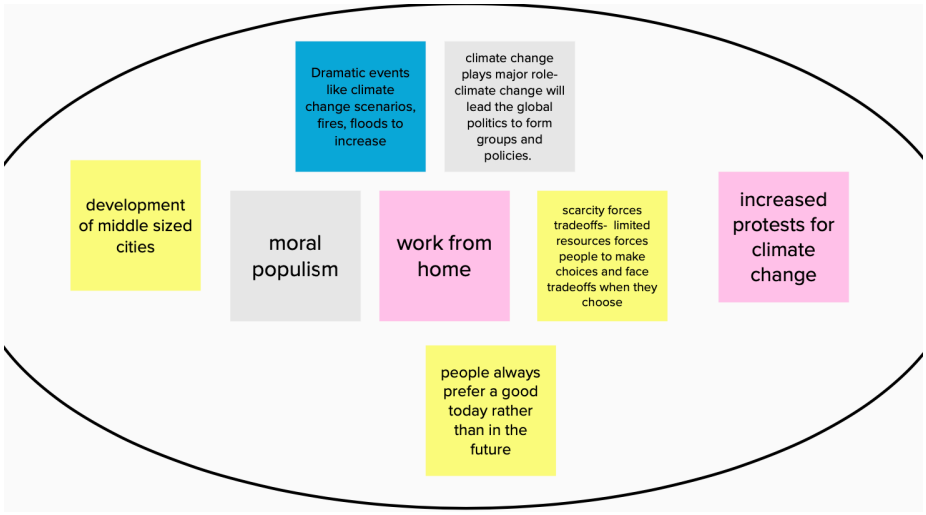

society as a whole- "In talking of society as a whole, in seeking to govern the economy as a whole, both politicians and technocrats will "loose touch" with how it feels to be a single citizen in particular.
cohesion policy to increase collaboration
Conflict of opinions- like brexit and Donald Trump showed that there is contradiction between what political scientists feel is best for people and what people find valuable and meaningful.
Fascists grow from the left out- when political debate no longer speaks to the people, they become responsive instead to slogans, symbols and sensations".
more social shares- more truthful
moral populism
Ethics or ambition? Curiosity is taking over morality or ethical concerns. In fact, technology is measured with different measurements in different countries, making it unclear for people to practice self governance.
climate change plays major role- climate change will lead the global politics to form groups and policies.
context-concept interaction- results of cohesion policy in Europe largely depend on the context in which it is implemented.

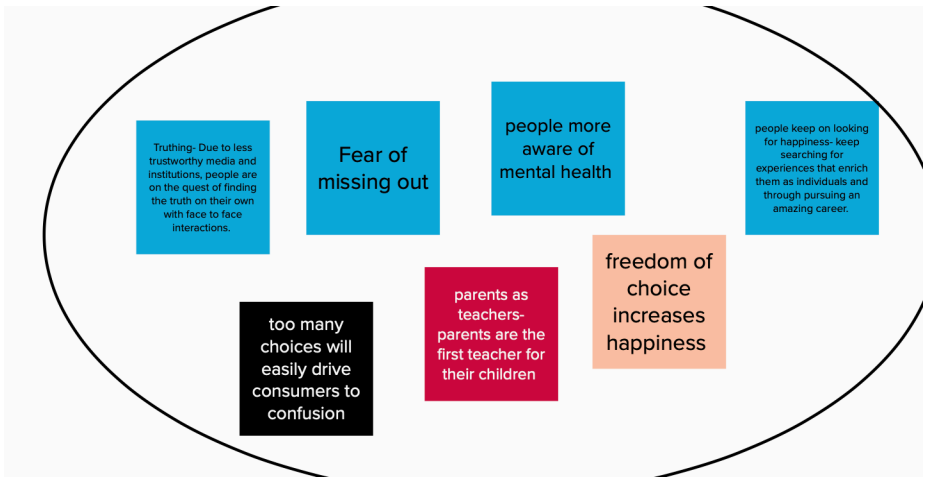

need of platforms which encourages peer to peer networks and
parents as teachers
believing the peers- knowledge transfer happens mostly through the experience of fellow students.

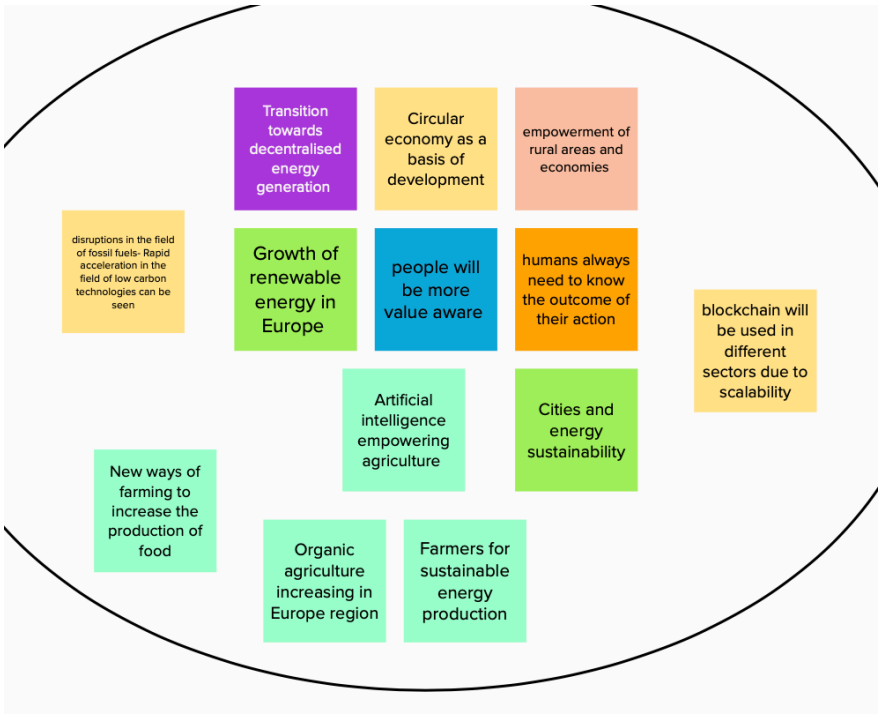

Favourable condition for trading globally and with neighbouring countries
Income of people in Europe will increase
People in Netherlands are able to purchase more
scarcity forces tradeoffs- limited resources forces people to make choices and face tradeoffs when they choose
mutual voluntary trade involving values/profi both parti
Income of buye price of other go and individua preferences pl important role demand of goo
development of middle sized cities
Slowing down of global economy
substitution Everyone is willing to trade some amount of one good for some amount of other
decreasing population in Europe
Aged richer and older human race in Europe
Europe will truly be a global continent with ties with more than 80 eastern and western countries

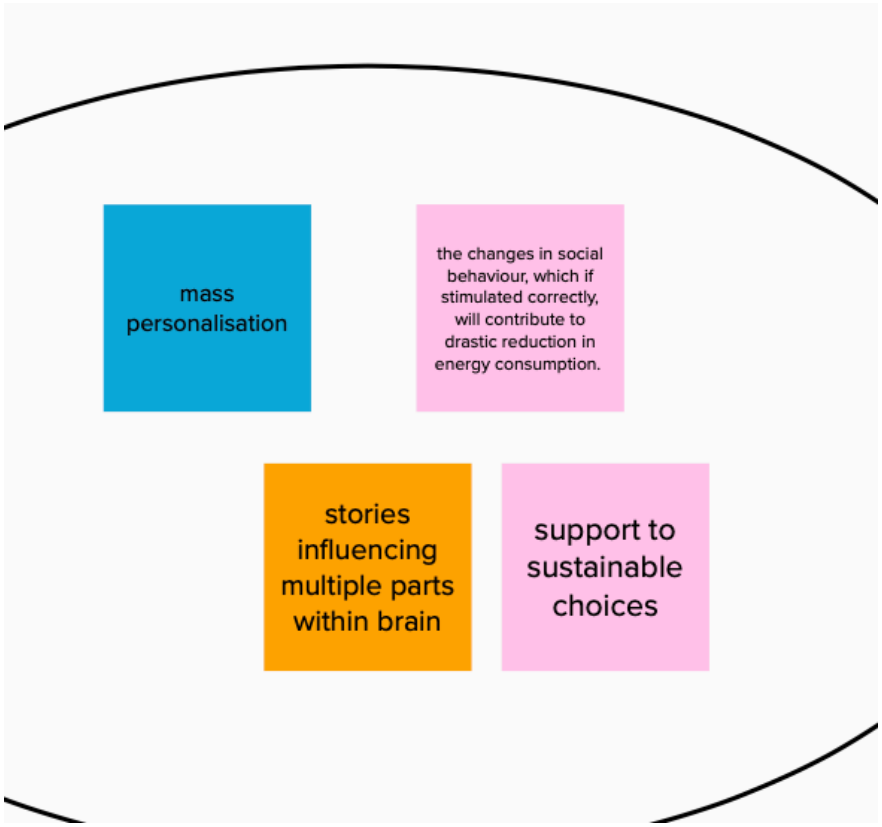
Participant 2


divided southern and northern Europe
Shorter attention span and more filtering power
Indestructible myths- The people, because of the new information and disruption of their worldview, feel threatened and so, reject the views of experts.
fragmented national governments
Short term innovation


Dramatic events like climate change scenarios, fires, floods to increase
climate change plays major role- climate change will lead the global politics to form groups and policies.
development of middle sized cities
moral populism
work from home
scarcity forces tradeoffs- limited resources forces people to make choices and face tradeoffs when they choose
increased protests for climate change
people always prefer a good today rather than in the future


Truthing- Due to less trustworthy media and institutions, people are on the quest of finding the truth on their own with face to face interactions.
Fear of missing out
people more aware of mental health
people keep on looking for happiness- keep searching for experiences that enrich them as individuals and through pursuing an amazing career.
freedom of choice increases happiness
parents as teachers- parents are the first teacher for their children
too many choices will easily drive consumers to confusion


Transition towards decentralised energy generation
Circular economy as a basis of development
empowerment of rural areas and economies
disruptions in the field of fossil fuels- Rapid acceleration in the field of low carbon technologies can be seen
Growth of renewable energy in Europe
people will be more value aware
humans always need to know the outcome of their action
blockchain will be used in different sectors due to scalability
Artificial intelligence empowering agriculture
Cities and energy sustainability
New ways of farming to increase the production of food
Organic agriculture increasing in Europe region
Farmers for sustainable energy production


mass personalisation
the changes in social behaviour, which if stimulated correctly, will contribute to drastic reduction in energy consumption.
stories influencing multiple parts within brain
support to sustainable choices