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THE FUZZY FUTURES OF NEO-CARBON WORK

Neo-Carbon Futures Clinique II

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NEO
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PREFACE

The world is aware that the concentration of wealth is increasing, income gaps are widening, employmentless economic growth seems the new norm, return on investment in capital and technology is usually better than labor, future technologies can replace much of human physical and mental labor, and the long-term structural unemployment is a "business as usual" surprise free forecast. But the world is not aware of long-range strategies to address these issues, other than focusing education on science, technology, engineering, and mathematics.

A review of related future work/technology research and a Millennium Project Real-Time Delphi study, showed that improving STEM education is good way to create employment up to about 2025 or 2030, but insufficient to address future unemployment after that due to artificial narrow and later artificial general intelligence, synthetic biology and genomics, robotics and autonomous vehicles, 3D/4D printing of materials and biology, peer-to-peer business models, nanotechnology, virtual and augmented mixed realities, brain intelligence augmentation, computational science, the Internet of everything, cloud analytics, quantum computing, and most importantly, future synergies among these. Some have argued that each progressive age created more jobs than those replaced. The industrial age created more jobs than the agricultural age and the information age is creating more jobs than the industrial age. But this time it is different, because of the acceleration, integration, and globalization of technological change and because the Internet makes simultaneous dissemination and feedback possible nearly everywhere about everything to everybody. And we have never faced an intelligence non-human force before: artificial intelligence that learns worldwide. And over the next generation or two the number of new entrants into the "job market" could be two to three billion people. The job-employer economic model may have to give way to a "Self-Actualization Economy.

This *Fuzzy Futures of Neo-Carbon Work* report on the Neo-Carbon Futures Clinique II explores many elements of potential futures and strategies to address these issues. Hopefully, this report will help stimulate a national and global, systematic, research-based discussion on how to make the transition to a new economy as smoothly as possible of the next generation or two.

Jerome C. Glenn, CEO
The Millennium Project
Washington D.C. December 2016

EXECUTIVE SUMMARY

This report documents and analyses the results of a Neo-Carbon futures clinique held at Hotel President in Helsinki 13th of April 2016. At the futures clinique workshop groups anticipated possible futures of peer-to-peer work – work that is self-organised by the workers. The futures clinique is part of the Neo-Carbon Energy research project. The foresight part of the project is concerned with studying the futures of peer-to-peer societies enabled by the proposed Neo-Carbon energy system. Such a system would be a distributed, renewable energy system that empowers citizens by providing them with cheap, clean and abundant energy and materials. In this project, possible futures of a peer-to-peer society are studied through four scenarios (Heinonen et al. 2016), which provided the framework also for this futures clinique.

The results of the futures clinique were summarised and refined into seven categories, each illuminating different aspects of the possible futures of peer-to-peer work. Common to the categories is the strengthening of values other than economic as the main drivers in economy and society. The categories are summarised below. For complete categories see the documentation in chapter 4.1.

1) Hybrid Companies – Work as a place for creativity and self-development

If robots took care of most material production and menial jobs, the work conducted by humans would satisfy first and foremost the needs of self-actualization and self-expression. Like employees, enterprises would pursue other goals than profits only, and would provide society different kinds of immaterial value. Work in such companies would require workers to self-define their jobs. Only then could work correspond with citizens' personality, gifts and interests. This implies that supply creates demand, not the other way around. People would do their "own thing" manifesting their personality, and trust that resulting "authentic" products would find their markets. However, those who would not be able to self-define their work, could easily become marginalised.

2) Intimacy Economy – Work and communities

If work became first and foremost self-expression, the traditional work-community would be transformed into a leisure-like "community of passion". Producers and consumers would have a shared lifeworld. There would be a personal, creative bond between the provider and the so-called customer. Demand would define supply in much more intricate and intimate ways than today. Artificial intelligences (AIs) could be enablers for work that is at the same time individualistic and collective. In practice, this could mean for example a platform that connects individuals with the same interest, tastes, goals, etc. with each other – enabling, for instance, a community for the curious.

3) Tribes of Meaning – Communities and identity

"Community work" would not serve the purposes of production and self-development only, but would also help individuals to construct meaningful identities. In future, identities, meaning and purpose could be based first and foremost on different work communities. Communities would provide a "personal mission" for individuals, as a basis for a more or less stable – albeit potentially changing and porous – identity. As citizens would co-create their communities and corresponding identities, culture would become much more diverse than today. This could lead many to yearn for stable and tight "bubble" communities, instead of potentially changing ones. Another possibility is that local communities would be replaced by a "global village", a cosmopolitan identity, or even by some kind of new world religion.

4) Condition of Hybridity – Networked work

If communities were the basic units of new work, the general organisation model for work could be provided by networks. Rigid organisations would be replaced by organic, porous network structures, and different communities would be linked together by interlocking networks. Resources would be shared within networks: workspaces, tools, information, et cetera. Networks could mitigate the "sectarian" tendencies of close-knit communities as the structure through which people could swap between different communities. Then again, networks would dissolve those very structures – such as nation states – whose loss make people want to belong to "closed" communities in the first place. The networked future would be defined by the struggle between the open network and the closed community.

5) Age of Empathy – Networks, sharing, and the common good

If material production was highly automated, people would not have to work as much as today to earn their living. This would create a fertile ground for altruism and sharing. Doing good and working for others could be an alternative to paid labour as meaningful activity. In a world of sharing and networks, money and other resources might be partly redefined as possessions of the network instead of private property. Networks would function more based on principles of open source than property rights. Value would not be understood only as monetary, but also as e.g. ethical, aesthetic, and social. Entrepreneurs would not focus on developing "a new camera app", but on solving the world's problems and providing for the common good. People would choose where to work according to values and goals they consider important, not according to monetary compensation.

6) The Robot Revolution Succeeded by the Human Revolution – The rise of humaneness

Technology would be both emphasised and downplayed. Society would be thoroughly technologized, but technology would be integrated seamlessly into environment so that it would be "discreet", mostly

invisible, and independent. Due to the development of artificial intelligence, technology would transform into less mechanistic and more human-like. As machines would automate many tasks done today by us, humans would be freed to use and develop their human skills, those which machines would not yet possess. "The revolution of robots" could be succeeded by "the revolution of humans". Humans would ask questions, set goals, and invent new needs, and the role of robots would be to help realising these plans.

7) Immaterial Competition – Communities, conflicts, and inequality

Although often deemed as egalitarian, new inequalities and social conflicts may arise in a networked, peer-to-peer future. Those outside startups and other "community companies" would be in inferior positions. Despite the culture of sharing, communities would compete with each other – there would be "winner" and "loser" communities. As a result of a shattered public sphere, each community and network could have their own knowledge, and morals, intensifying disputes between communities. In a world of material and energy abundance people could compete on cultural and social capital instead of economic status. Inequality could also manifest itself as "qualitative unemployment": many would have to work in jobs that do not allow creativity or self-expression. If the world becomes increasingly chaotic and insecure due to fragmentation of culture and values, "cultural" fanaticism can become increasingly alluring for many.

To summarise, while renewable energy may create novel jobs, there are large structural issues driving the future of the labour market and working life. The Futures Clinique results and its seven (7) identified themes point to a "post-work" future of a peer-to-peer society, where work is no more a separate sphere in society. If people self-organise as peers, and if robots and artificial intelligences (AIs) carry out many or most of the tasks – work begins to resemble what we today conceive as voluntary or hobby activities that make life meaningful. Also for this reason, firms could become increasingly significant social and cultural actors. As emerging technologies require energy, demand for renewable energy may increase. However, the future communities could become divided into networked (or open ones), and those that prefer isolation (and stability). Other novel inequalities could also emerge. Finally, the decentralisation of power and less and less hierarchical organisational models will continue to transform society. While in economic life some actors have already moved into this direction, whether politics is able to follow, remains an open debate.

1. INTRODUCTION

This chapter briefly introduces the Neo-Carbon Energy project which gives the context for addressing the topic of this report. Futures Clinique as a method is also described in its various phases in order to provide transparency for how the topic was tackled and elaborated.

1.1 Neo-Carbon Energy

The Futures Clinique reported here is part of the Tekes-funded Neo-Carbon Energy project (2014-2017).[1] The project is concerned with studying a wholly renewable energy system with hydrocarbon storages and new ways of replacing hydrocarbon-based production of fuel, liquids, and chemicals. The foresight part of the project anticipates socio-economic implications of the new energy system. As this proposed energy system would be distributed and provide energy at low costs, it would promote a peer-to-peer society of grassroots organisations. The societal aspects of the energy transition are studied through four transformational scenarios in the year 2050.

In the first Neo-Carbon Energy Futures Clinique at Sitra (see Heinonen et al. 2015) the theme of work was raised during brainstorming as an important issue to be dealt with in more detail. Thus this second Futures Clinique addressed the futures of work of different communities envisioned in the Neo-Carbon scenarios (Heinonen et al. 2016).[2] The Future of Work/Technology 2050 scenarios of the Millennium Project were also used as background material for the Futures Clinique described in this report (see ch 3.4).

Neo-Carbon Energy is a joint strategic research project (2014–2016) of the Technical Research Centre of Finland (VTT, co-ordinator), Lappeenranta University of Technology (LUT), and Finland Futures Research Centre (FFRC), University of Turku. It is funded by the Finnish Funding Agency for Innovation (TEKES). The foresight part at FFRC is directed by prof. Sirkka Heinonen at the Finland Futures Research Centre (FFRC). The FFRC research team consists of project researchers Joni Karjalainen, Juho Ruotsalainen and Marjukka Parkkinen. Project researcher Hazel Salminen and development manager Leena-Maija Laurén have also participated in the project, especially in organising Futures Cliniques.

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[1] For more information, see www.neocarbonenergy.fi and https://www.utu.fi/en/units/ffrc/research/projects/energy/Pages/neo-fore.aspx
[2] The total of four interactive Futures Cliniques will be conducted in the project.

1.2   Futures Clinique

Futures workshop is a central method for futures studies originally developed by Robert Jungk (Jungk & Müllert 1987; Nurmela 2013). The original aim of working in future workshops is to draw in all interested stakeholders – especially citizens – to look for new solutions that otherwise would only be left to politicians, experts and planners. The individuals' experiences and hopes arising are also important in shaping the future. In futures workshops the participants – business representatives, researchers, citizens, students, non-governmental organisations (NGOs) et cetera – work together in small groups to anticipate possible, probable and preferred futures of a selected topic (Nurmela 2013). Futures Clinique is a distinctive futures workshop developed by Sirkka Heinonen at the Finland Futures Research Centre (FFRC), University of Turku (Heinonen & Ruotsalainen 2013).

The main distinction to other futures workshops is that Futures Clinique is especially designed to anticipate and create radical and transformative futures – futures that differ significantly from the present. To anticipate such radical and transformative futures, the Futures Clinique places a strong emphasis on weak signals – new phenomena and issues that are more or less marginal, but can strengthen in the future. Real change lies in weak signals, as they bring about issues that are qualitatively different from the issues of the present. On the contrary, trends and megatrends point to quantitative changes – more or less of something that already exists, is widely known and can be measured. In other words, the Futures Clinique rather deals with discontinuities instead of continuities. It also invites to thinking about uncertainties and surprises, sudden events with low probability and high impact i.e. wild cards (Day & Schoemaker 2006; Petersen 2008; Kuosa 2010; and black swans (Taleb 2010; Heinonen 2013).

The Futures Clinique process begins with a background research, in which weak signals are scanned and analysed. The results of the background research are written as an orienting material to be sent to participants before the workshop. The actual workshop is launched with a Futures Provocation[3], a presentation to summon up (Lat. pro + vocare, call forth) new ideas and *boldly* creative futures thinking (Heinonen et al. 2016b). After the Futures Provocation, a Futures Window is shown. Futures Window is a visual presentation of weak signals for possible futures, accompanied by background music (see Hiltunen & Heinonen 2012). It is intended to develop the viewers' futures consciousness, by opening up innovative futures thinking through visual stimuli. Viewing the futures window helps to move towards experiencing the futures, even immersing in futures (future images).[4]

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[3] This Futures Clinique was opened by welcoming words by Tiina Kähö from Sitra, the Finnish Innovation Fund, Senior Lead of Carbon-neutral industry, now Executive Director at Helsinki Metropolitan Smart & Clean Foundation. She also acts as a reviewer of the Neo-Carbon Energy Project.
[4] For experiential futuring see more in Heinonen & Balcom Raleigh 2015.

The Futures Window is succeeded by group work sessions, in which several ready-to-use fore-sight methods are used. These include the Futures Wheel, a mindmap-like method of collecting ideas, discussing them and anticipating their effects (Glenn 2009 in Glenn & Gordon 2009). The most interesting and relevant ideas of the Futures Wheel are next analysed and elaborated by using the Futures Image and the Futures Table. In this particular Futures Clinique the groups refined the most interesting results by writing a Futures Image in the form of a short narrative of Finland in 2050. The main components of the Futures Image were then analysed using a Futures Table called ACTVODE, developed at Finland Futures Research Centre, which analyses actors (A), citizens/customers (C), transformation processes (T), values (V), obstacles (O), drivers (D), and energy (E).[5]

The final phase of the group work sessions is the presentation of the results of each group to other groups i.e. cross-fertilisation. After the workshop, the moderators document, analyse and synthesise the results as a research report.

Figure 1. Futures Clinique is a mixed methods process, comprising various foresight tools. Here group 5 is working on their ACTVODE Table, after constructing their Futures Wheel (left) and Futures Image. (Photo: Sirkka Heinonen)

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[5] For the ACTVOD method see Lauttamäki, 2016. The acronym stands for the words Actors, Customers, Transformation processes, Values, Obstacles and Drivers. The approach is developed from of the CATWOE workshop used in Soft Systems Methodology (Checkland 1981). In our Clinique we added one more dimension E = Energy, and thus applied the ACTVODE approach. Please note that this was an experiment to vary with different Futures Table structure. We frequently use in our Neo-Carbon Energy project another Futures Table structure that is called PESTEC. This acronym comes from the dimensions of Politics, Economy, Society, Technology, Environment, and Customer, Client or Culture. For application of PESTEC Table see e.g. Heinonen et al. 2015.

2.   NEO-CARBON ENERGY AND PEER-TO-PEER SOCIETY

This chapter discusses future trajectories and potential of the 100% renewable energy revolution in connection with falling transaction costs of both information and goods production. The themes of future abundance, technology advances, human creativity, peer-to-peer production are raised as driving forces of the networked information economy.

2.1   Falling marginal costs make 100% renewable energy revolution achievable

A wholly renewable energy system is possible to achieve by 2050. It would be based mainly on solar and wind energy and their storage technologies (Breyer et al. 2016). This would mean a huge shift in how energy is produced and consumed. However, studies of new energy systems often neglect the social and societal aspects of the transition (Li et al. 2015). From a whole-of-society perspective, perhaps the most radical consequence of the renewable energy transition would be the plummeting marginal cost of energy – wind and solar energy are in principle free once their fixed costs have been covered (Rifkin 2014).

The falling marginal costs of energy would be one more addition to an intriguing group of events. Information and communication technologies have dramatically decreased the costs of the production, processing, and distributing information. Thus the marginal costs of information have been close to zero for a while already (Benkler 2006). As physical production is being automated, and as information is increasingly applied to material production processes, the marginal costs of physical production are also decreasing, and will probably continue to do so at an accelerating pace (Mason 2015; Drexler 2013). Together these developments will have radical impacts on every sphere of society.

Automation, ubiquitous information and communication technologies, and renewable energy systems with near-zero marginal costs imply a future of abundance instead of scarcity (Drexler 2013; Mason 2015). This, in turn, hints at an upheaval in markets, price mechanisms, and organisation models, which are based on the assumption of scarcity. We may be entering a post-work and post-capitalistic society, where the necessary labour time of humans is reduced near zero, and where non-market, peer-to-peer, and collaborative commons organisation models replace traditional organisations (Mason 2015; Rifkin 2014; Benkler 2006).

Falling marginal costs have leveled the playing field for small, grassroots actors. On this premise, Rifkin (2011) anticipates the third industrial revolution, where production moves from large factories to small-scale workshops and cooperatives with the aid of renewable energy and digital production technologies, such as 3D printing. In the future, production may thus divide in two: the "necessary labour"

done mainly by robots, and voluntary production by self-organising peers. Presently, peer-to-peer models are usually used to describe digital open collaboration projects, such as Wikipedia and Linux, but they can be applied to organisations in general, both physical and "virtual" (Kostakis et al. 2015).

Figure 2. Renewable energy revolution becomes achievable via falling marginal costs. (Photo: LUT)

2.2 Technology advances mingle with human ingenuity

Robotisation and applications of artificial intelligence (AI) are perhaps the most topical questions of the futures of work, as they replace many of the jobs done today by humans, and thus deeply transform practically every industry (Brynjolfsson & McAfee 2014). However, views on the outcome of the upheaval are polarised. Half of the respondents (48 %) of an expert study (Pew Research Center 2014) envisioned that by 2025 new technologies have replaced significant amounts of blue- and white-collar jobs leaving many unemployed. The other half (52 %) anticipated that human ingenuity creates new jobs at a rate that ensures jobs and decent income also in the future. Be that as it may, new technology and AI surrounds us in everyday life. Chace (2015) reminds us that people in developed economies interact with AI systems many times a day without even being aware of it. In the short and medium term we have to combat the looming prospect of technological unemployment.[6] Yet, in the long term

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[6] Ross (2016) points out that the effect of robots on job loss will be highly differentiated by country. Those countries - e.g. South Korea, Japan and Germany - that are developing and manufacturing robotics for export, house the headquarters, engineers, and manufacturing facilities, are in the best position. Susskind & Susskind

we will be facing the arrival of artificial general intelligence (AGI) i.e. conscious machines with volition – a genuinely existential threat facing humankind (ibid.). Boström (2014) in his book on Superintelligence catalysed a scholar debate on this threat, echoed by such futurists as Leonhard (2016).[7]

To tackle the challenge posed by technological and economic changes, new visions for the future of work are pressingly needed. As the world becomes more affluent and production more efficient, largely due to new technologies, there will be a growing opportunity for economic arrangements that maximise other than mere economic values (Goertzel et al. 2016). Dufva et al. (2016) suggest meaningfulness, communities and networks as new guiding narratives for work in a highly automated economy. In a similar vein Kilpi (2016) sees the organization of the future as a community of people, brought together by a common purpose and shared values instead of monetary incentives. Kilpi (ibid.) defines the future of work as "complex patterns of communicative interaction between interdependent individuals". This implies that supply and demand are not separate, but intertwined inseparably through constant and organic communication. Brynjolfsson and McAfee (2014), in turn, anticipate peer-to-peer production as a promising possibility in opening previously unavailable economic opportunities and giving people something meaningful to do in an automated future. Peer-to-peer is an encouraging model for a post-work or "post-capitalistic" society, as it does not require markets and monetary transactions to work properly. Peer-to-peer production can be defined as a distributed network of free participation of equal partners. Participants are engaged in the production of common resources without monetary compensation as the key motivating factor. Peer-to-peer production creates Commons (shared, free resources), which relies on social relations rather than pricing mechanisms or managerial commands to allocate resources. (Orsi 2009.)

Peer-to-peer-production and open collaboration can be anticipated to become increasingly common in the future especially due to economic, technological, and cultural drivers. Economic value is generated more and more from immaterial production and the creative industries (economic driver). Ubiquitous information and communication technologies allow new kinds of open and peer-like organization structures, and have placed the means of production in the hands of citizens (technological driver). People's values are moving towards self-expression and inner motivations in work (cultural driver) – open collaboration includes such motivators as self-actualisation, recreation, and fun (Budhathoki & Haythornthwaite 2012).

(2016) on the other hand, draw our attention to the transformative nature of this phenomenon – gradual replacement of professionals by increasingly capable systems (AI).

[7] Leonhard (2016) is mainly concerned with the clash between human and machine, and discusses the threats of digitalisation to humans e,g, in the form of digital obesity or in the emerging Internet of Inhuman Things. A number of celebrities such as Bill Gates, Elon Musk, Bill Joy and Stephen Hawking have already earlier given such early warnings as well (see more in the chapter about Millennium project scenarios in ch 3.4).

Figure 3. Meaningfulness is a central element and motivation in work – increasingly so in the future. (Photo: Sirkka Heinonen)

2.3   Peer-to-peer production and open collaboration in a new economy of self-organising

Along these lines, in the following we describe the basic logics of peer production and open collaboration according to Yochai Benkler (2006; 2002). Benkler (2002) claims that due to different drivers, peer-to-peer, nonmarket, and nonproprietary production may become not only possible, but the dominant form of production and organisation in the future. Benkler (2006; 2002) bases his claim on the assumption that human creativity and the economics of information have become the core structuring features of our economy.

Such a production will arise as the third way to organise production along with the market and the bureaucracy, due to the nature of information. In markets, the allocation of production is done through price signals, and in bureaucracy according to the management decision-making. In the peer-to-peer model allocation is self-organised: producers decide for themselves, what they do, how, and with whom. (Benkler 2002.) Benkler claims that self-organisation is the most efficient way to deal with information products. Information and culture are public resources (commons) by nature, as they are non-scarce and their consumption does not prevent others to consume them – they are non-rivalry. The marginal cost of information products is thus near zero. Supply and demand, which set the price for a product, assume scarcity. Because information is non-scarce and non-rivalry, intellectual prop-

erty rights have been established to give information products a price. This, however, leads to underutilisation of information. If the price of information is low or free, it spreads more widely and is put to use more efficiently. Production of new information is based on the existing information, and thus the more information is available, the better it can be refined as new products. (Benkler 2002.)

The remaining scarce resource in immaterial production is human creativity, which is utilised best in an environment of free information and self-organisation. This is due to two reasons especially. As creativity and culture are built on existing human capital and cultural resources, the more cultural contents are available, the better they nourish creativity and production of new culture. Self-organisation of producers ensures the free flows of information better than traditional organisations, which tend to keep information to themselves. Second, creativity is very hard to standardise and administer by managers. People know their creative capabilities best themselves, and thereby the best way to organise creative labour is to let people decide for themselves in which projects to work on and how. Furthermore, when information flows freely, potential producers and suitable projects can be matched efficiently. (Benkler 2002)

Such "new economy" of peer-to-peer production and open collaboration would stretch also to the sphere of culture and values. According to Benkler (2006), the open, networked information environment would make culture more democratic, participatory, transparent, and malleable. We would see an emergence of a new folk culture, where by participating in the creation of shared culture and finding of meaning, self-organising citizens would also create culture that is much more of their own than the mass-media-type of industrial one (Benkler 2006). As identities and meanings are always co-constructed, and efficient ICTs allow for more fluid communication, people would be better able to form communities with the like-minded peers (Castells 1997). In the new "folk culture" identity would be based increasingly on such grassroots communities instead of structures such as the nuclear family and the industrial organisation. Individuals and their communities would thus have increased capabilities as the core driving forces of the networked information economy.¨

Figure 4. Example of "folk culture" based self-organised peer-to-peer production in de Ceuvel, Amsterdam. (Photo: Sirkka Heinonen)

3. ORIENTATION TO THE FUTURES OF NEO-CARBON WORK

This chapter presents the orientation material sent to the participants before the Futures Clinique, as well as the themes for each group. The themes were chosen from the scenarios, respectively (ch 3.1). Thus, for example, for the Radical Startups scenario, the theme chosen was Startup Communities. In addition, a collective and provocative Futures Image (ch 3.2) and a list of Ten Theses for the Future of Neo-Carbon Work was sent to the registered participants with the orientation material. Co-inciding with this work, the Millennium Project had an ongoing Real-Time Delphi with related scenario work on the same topic. Therefore, information about the MP work was also given (ch 3.3) at the Futures Clinique during the Futures Provocation, as well as written material.

3.1 Themes from Scenarios for Futures Clinique Groups

The group work in the Futures Clinique was divided into following four themes representing the communal aspect in neo-carbon energy scenarios, each depicting one possible future of peer-to-peer work (the full scenarios are available at https://www.utu.fi/fi/yksikot/ffrc/tutkimus/hankkeet/Documents/NeoCarbon-WP1-1-2016.pdf). Upon registration, the participants chose the theme they wished to work with during the Futures Clinique. The themes related to the scenarios described communities or communal ethos prevalent in the scenarios, respectively. Two groups worked around the theme/scenario Freelance economy & open collaboration – New Consciousness. *The communities* raised from scenarios are briefly described in the following.

1. Startup communities → Radical Startups scenario

Economy is driven by networks of startups enterprises. Startups are community-like, with very flat hierarchies. They promise their workers opportunities for meaningful self-expression, and often the opportunity to work with like-minded individuals is the main motivation by which people decide where to work. The borders between leisure and work, and between companies and the rest of the society are blurred.

2. Corporate communities → Value-Driven Techemoths scenario

The economy is dominated by a few big corporations, who have successfully merged different business sectors, ambitious R&D, as well as functions previously provided by the public sector. These technology giants, or "techemoths", offer resources, facilities, and platforms for self-organising employees, as well as all the basic amenities from housing to leisure to education.

3. Cottage Industry and DIY communities → DIY Engineers scenario

Society is organized around thriving local communities. Do-It-Yourself economy and practical mind-sets flourish, and engineer-oriented citizens live off their skills and knowhow, spread through mesh networks. Tinkering, smart scarcity, local energy production, self-sufficiency and upcycling of products are trending.

4. Freelance economy & open collaboration → New Consciousness scenario

Robots take care of the most of manufacturing. People are freed from work and get to spend their time on leisure activities, which also provide value for the society at large. Society can be described as "fully automated luxury communism", and it is organised as global collaboration and open sharing of resources and information. Human beings share a collective tech-enabled consciousness – through ubiquitous communications, virtual reality, and also rudimentary brain-to-brain communication, and are deeply intertwined with each other and the nature.
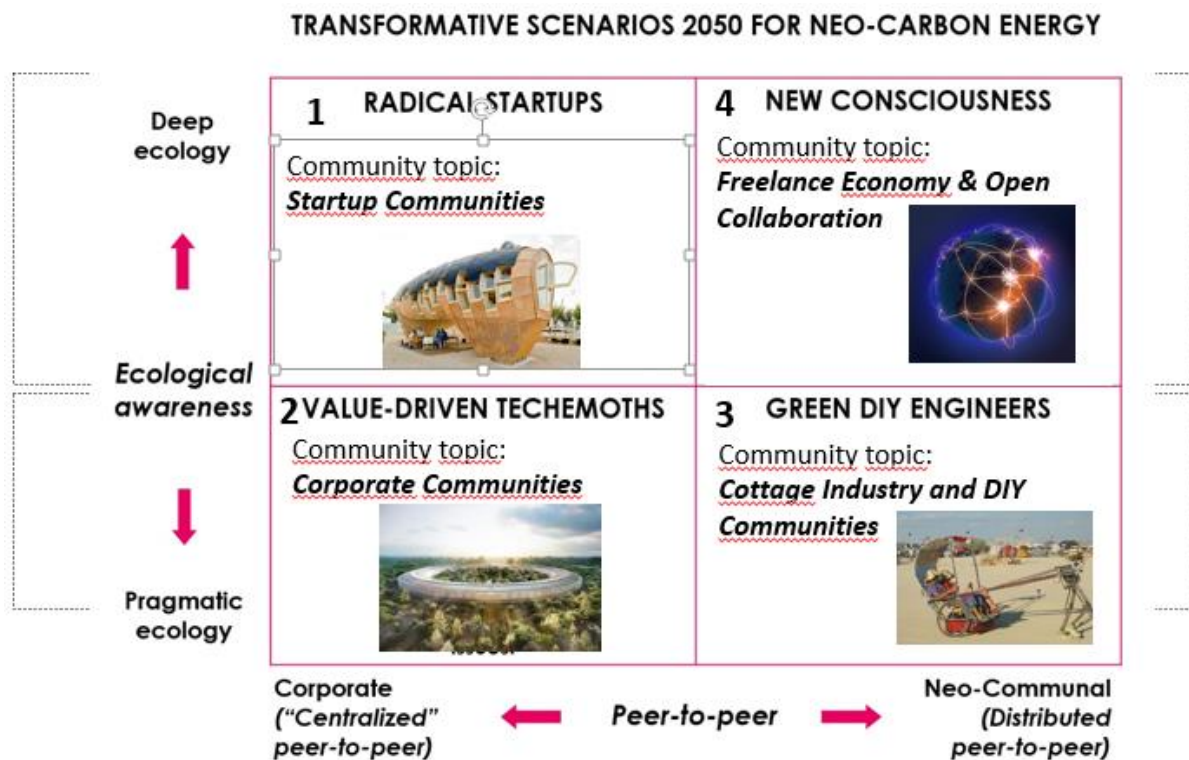

Figure 5. The neo-carbon energy scenarios in the framework of their scenario axes (peer-to-peer and ecological awareness) and their respective community topics.

3.2　Futures Image – Fully Automated Luxury Communities

This Futures Image below was sent to the participants of the Futures Clinique beforehand to illuminate the societal promises of the neo-carbon energy system. The Futures Image in question is a collective and provocative call for imagining futures, a teaser for futures thinking and deliberation for which elements in the image seem as possible, probable or preferred, the same with the text as a whole depicting a Futures Image.

Imagine a future in which renewables – especially solar and wind – provide all of our energy. Surplus energy would be stored in batteries, synthetic methane and other hydrocarbons. Energy would be abundant.

If humanity could capture one permille (0.1%) of the solar energy facing the earth, we would have six times the energy consumed today[1] – and it would be of almost no-cost. Energy would become a public good and freely accessible to all.

Then imagine if robots were so sophisticated they would take care of most of our labour. They would use recycled materials as well as materials made of synthetic hydrocarbons (carbon captured from air, hydrogen from water).

We would have an abundance of energy and resources. This would make possible so many things that now are hard to imagine – and it would all be ecologically sustainable.

Humans would be freed from work as we know it today. We probably would not stay idle, but engage in productive activities we personally find interesting. Workplaces would be like any communities where like-minded individuals come together – to exchange ideas, create new culture, and design products to be manufactured by robots.

Because energy, technology and materials would be so cheap, there would seldom be any use for large and clumsy organisations of today. Instead, citizens would self-organise on a peer-to-peer basis.

However, organisations would still exist. Most would be small, nimble and intimate. But a few would have managed to amass so much cultural, financial and social capital that they would have become irresistibly alluring for thousands and thousands – creating city-like societies of their own.

Some DIY engineer enthusiasts would prefer staying on their own, inventing on the fringes. And among the most cutting-edge, fusing their minds with conscious technology, some would be developing an altogether new consciousness. This "global brain" would use so much energy that it has been impossible to bring about until now.

3.3   Ten Theses for the Future of Neo-Carbon Work

The following theses of trends are shaping the future of work and thus present interesting starting points for elaborating on the futures of work.[8] This text was written by the Neo-Carbon Energy project group before the Futures Clinique and sent to the registered participants beforehand. The idea of presenting the theses was to provide food for thought for the participants. The idea of providing top ten theses about the topic to be debated is launched by Osmo Kuusi for regular seminars adopted as the top ten futures approach by the Finnish Society for Futures Studies.[9]

1. **Robotisation will replace human labour in manufacturing as well as in the "creative industries"**. However, it is up to debate whether robotisation will discard more jobs than it creates. Thanks to robots, human labour is freed for non-routine and creative tasks, thus creating new jobs.[10] Still, many will likely become unemployed, and this is a pivotal challenge to be tackled.

2. **The services sector and the creative industries will become increasingly dominant**. Service sector already makes over 70% of GDP in the EU and almost 80% in the United States[11]. Creative industries are one of the fastest growing sectors of economy, and in Europe employ more than twice the car industry.[12] This poses requirements to develop new working skills – and possibly increases inequalities between those able to adapt and thrive and those who struggle to cope in a more creative and immaterial economy.

3. **Self-employment and freelancing will strengthen**. In Finland self-employment has more than doubled between 2000 and 2013, making it the fastest growing form of employment.[13] Self-employment intensifies specialisation – people create their own niches and specialise according to their own areas of interest. However, self-employment bears the risk of increasing the precarious conditions of work – where social payments are externalised to the freelancer.

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[8] Many of these issues will also be addressed in the future of work 2050 scenarios by the Millennium Project. The scenario report will be published later in 2017. The most recent version is available at http://www.millennium-project.org/millennium/Work-Tech-2050-Scenarios.pdf

[9] The Finnish Society for Futures Studies arranges Top Ten Seminars every other year. Recent topics include futures of media, cities, and artificial intelligence. Osmo Kuusi is a special advisor to the neo-carbon energy project and Co-Chair of the Helsinki Node of the Millennium Project (for MP see ch 3.4)

[10] http://www.theatlantic.com/business/archive/2016/01/automation-paradox/424437/

[11] https://www.cia.gov/library/publications/the-world-factbook/fields/2012.html

[12] http://www.ey.com/Publication/vwLUAssets/ey-cultural-times-2015/$FILE/ey-cultural-times-2015.pdf

[13] http://www.stat.fi/tup/julkaisut/tiedostot/julkaisuluettelo/yits_201400_2014_12305_net.pdf

4. **Work and leisure will become inseparable, and basic income will open up new possibilities.** Leisure time will be the new lifelong education, and one's persona and work identity will blur altogether. It is possible that robotisation will increase free time. In such future, especially if supported by basic income, people can refine their hobbies and leisure activities into work. Work and leisure will further be fused with learning. Your hobby may become your new job. The risk is that all life is sacrificed to work, and private time ceases to exist.

5. **Work will become psychologically more demanding and more fulfilling.** In the era of immaterial labor, work will be self-expression, and vice versa. This creates new kinds of occupational health issues, but also makes work more individually satisfying. To balance out stressful knowledge work, a need to work with hands is accentuated. Handicraft may be job, hobby or therapy.

6. **Work will be done increasingly through different platforms.** Uber is a prime example – a taxi service without owning any cars. Airbnb is a home rental service without owning any apartments, Amazon is a bookselling service without any bookshops. Expect such platforms to emerge also in white-collar industries. Platforms and new type of match-making strengthen especially, if freelancing becomes more common.

7. **Products will become platforms, too.** For instance a car of the future will likely be a combination of different services, provided by different companies. Products and services are also offered increasingly through platforms – think of Facebook, Apple and Google. Energy is no more just a technology, but a service.

8. **Great electrification with wind, solar and other renewables will transform the economy.** Energy will be cheap, abundant and distributed, opening possibilities for new growth. Businesses' carbon neutrality and ecological values have a central role when employees decide where to work. People commute by walking, cycling, or mass transport and cars that run with electricity or fuel generated from renewables.

9. **Everything will be recycled.** The coffee mug of the future workplace has been manufactured from used materials in factories that run on renewable energy. Everything now circulates - from wood to steel and copper as well as rare earth metals. Entire value chains that span across several industry sectors have become climate compatible. Cradle-to-cradle thinking transforms waste into raw material.

10. **As the lifelong jobs die off, the ability to adapt becomes a central skill.** Due to the rapid changes within society, occupations and required skills, the ability to become adjusted to new conditions, tasks, and people is a necessity. In order to succeed in this kind of resilience and even

antifragility, it is important to know how to tolerate insecurity and even thrive on uncertainty. You might be hired based on the number of your Twitter followers, or if some prominent thought-leader retweets you[14].

Figure 6. The ability to adapt according to different contexts and requirements is a major skill needed for being resilient in future work life. (Photo: Sirkka Heinonen)

3.4   The Future of Work/Technology 2050 by the Millennium Project

This chapter is included in this report of our Futures Clinique on Fuzzy Futures of Work 2050 for two reasons. Firstly, the topic of future of work is indeed "hot" – throughout the world in most countries on every continent the topic of work and employment is important, even critical. Work is a complex issue, and the problem of disappearing workplaces and means of livelihood is a wicked problem. It is a question of economy, as much as that of society, culture and technology. Work is a typical example of a topic that has to be addressed holistically and systematically as futures studies propose to do for any issue under investigation or anticipation.

The interconnectedness of work with future developments of technology, especially of robotisation, digitalisation and artificial intelligence is also a fertile topic from the point of view of futures studies. The cause and effects lines, interrelations, opportunities and threats abound, and they just have to be tackled from many points of view. The Millennium Project has an ongoing study on the

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[14] http://www.futureofwork.com/article/details/personal-branding-key-career-skill-in-the-future-workplace

Future of Work and Technology 2050. Since the topic is of mutual interest, and since the Neo-Carbon Energy project is networked with the Millennium Project (from here onwards referred to as MP), we wish to provide information about this MP project and specifically about its study on futures of work and technology 2050. The Millennium Project is a global participatory think-tank, active through its ca 60 nodes around the globe.[15] The Nodes identify long-range challenges and strategies, and initiate and conduct foresight studies, workshops, symposia, and advanced training. The Millennium project produces the annual State of the Future reports, the Futures Research methodologies series, the Global Intelligence System, as well as special studies such as the one mentioned above. During the time of futures Clinique, the MP study had run its Real-Time Delphi study. Many Finnish experts participated in the study. In the futures Clinique, information was given on the three MP scenarios under construction. These scenarios are described in brief below.

Jerome Glenn invited participants globally to the Delphi/scenario study by reminding us how Stephen Hawking, Elon Musk, and Bill Gates are warning the world about the potential dangers of artificial intelligence growing beyond human control. Whether AI does or does not, it is certain that it and other future technologies will have fundamental impacts on the nature of work and economics over the next 34 years. The world needs a serious long-term global exploration about these matters and therefore the Millennium project seeks to include many experts' thinking in this exploration.

At the time of the Futures Clinique, the results of this international Real-Time Delphi questionnaire on these issues were conducted by the Millennium Project and were informed to be available at http://www.millennium-project.org/millennium/Future-WorkTechnology_2050.pdf. The results were since then used to create three alternative global work/tech 2050 scenarios:

- Scenario 1: It's Complicated – A Mixed Bag
- Scenario 2: Political/Economic Turmoil – Future Despair
- Scenario 3: If Humans Were Free – The Self-Actualizing Economy

These three scenarios are briefly described in the following.[16]

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[15] Prof Sirkka Heinonen is Chair of the Helsinki Node of the Millennium Project, and Jerome Glenn, Executive Director of MP, has visited Finland on many scientific occasions.
[16] The texts here are brief versions modified by FFRC research team.

2050 Scenario 1: It's Complicated – A Mixed Bag

Much of the world in the early 21ˢᵗ century pictured a future of massive unemployment due to advances in artificial intelligence, robotics, and other technologies replacing human labor. Today we see those fears were exaggerated.

Human creativity is extraordinary. Employment growth in synthetic biology and other new industries are booming today employing half the world, while self-employment has become an aspirational norm for many, accounting for the other half the world's 6 billion workforce. Some basic income guarantee plans around the world have helped to reduce the social chaos expected from those who faced long-term structural unemployment. However, cyber treachery continues to be widespread and complex, many are unsure whom or what to trust as the world continues to merge mind and machine. Sporadic mass migrations due to political, economic, and environmental factors continue to threaten global security.

Scenario 2: Political/Economic Turmoil – 2050 (Future Despair)

During the early 21ˢᵗ century, political leaders were so mired in short-term, me-first, selfish economic thinking that they did not anticipate how fast artificial intelligence, robotics, 3D printing, synthetic biology, and other technologies would make business after business obsolete beginning dramatically in the late 2020s. Economists and lawyers who knew little of the coming technology induced unemployment crowded out those with knowledge of what was coming. Corporate lobbyists protected short-term profit decisions. Hence there were no long-term strategies in place to reduce the devastating impacts of the dramatic growth in unemployment around the world beginning in the early 2030s, especially in high and middle income countries.

The concentration of wealth was increasing, income gaps were widening, employment-less economic growth had become the new normal, return on investment in capital and technology had become far more than labor, and the number of persons per services and products had dramatically fallen. Even though these problems were clear to all leaders as early as the mid-2010s, the political gridlock between conservatives and progressives had become so bad that by the 2020s intelligent discourse about economic policy was dead. Superficial news coverage and trivial social media so filled the public's attention, that little time was spent to understand the gravity of these changes. Even though capitalism, socialism, and communism were early industrial age economic systems, any serious discussions of post-information age economic systems were ridiculed.

2050 Scenario 3: If Humans Were Free – The Self-Actualizing Economy

The transition to the Self-Actualizing Economy has begun. Although this transition is not complete, we have come a long way. For the first time in history, humanity is engaged in a great conversation about what kind of civilization it wants and what we, as individuals and as species, want to become. The historic shift from human labor and knowledge to machine labor and knowledge is clear: humanity

is being freed from the necessity of having a job to earn a living and a job to achieve self-respect. This is initiating the transition from the job economy to the self-actualization economy.

Humanity began to break free from the anxiety and pressure to make a living when artificial intelligence evolved into artificial general intelligence in the mid-2030s and as the basic income guarantee experiments in the early 21ˢᵗ century were shown to have positive effects. People tended to use the income to make more income. As the industrial revolution replaced muscles so the AI revolution is replacing knowledgeable brains. As the numbers of unemployed continued to increase due to no fault of their own, but due to new technologies, many began to lobby for a basic income for all. But the cost of living back then was still too high for national budgets to afford. It wasn't until the mid-2030s that the cost of living began to fall enough and government income began to increase enough that basic income systems became financially sustainable.

Interestingly enough, scenarios on work and technology for 2050 by the Millennium Project arrive at quite similar conclusions as the reflections from this Futures Clinique organised by the Neo-Carbon Energy project (Ruotsalainen et al. 2016). The set of three MP scenarios was used in an article written about the contents of this futures Clinique as a topical framework to discuss the results of the analysis in an international context (ibid.). The first MP scenario, It's Complicated – A Mixed Bag is a business-as-usual trend projection of the increasing acceleration of change with both intelligence and stupidity of decision-making. It resembles Radical Startups and Value-Driven Techemoths scenarios of the Neo-Carbon Energy project (see ch 3.1). This is because all of them deal with a future that is polarised between the well-off and the more or less marginalised, and where corporations have a lot of power. In the second MP scenario, Political/Economic Turmoil – Future Despair, governments do not anticipate the impacts of artificial general intelligence and have no strategies in place, when unemployment explodes in the 2030s. This scenario resembles Green DIY Engineers scenario, both being collapse scenarios with anarchic tendencies. The third MP scenario, If Humans Were Free – The Self-Actualization Economy, is a "transformation" scenario where governments anticipate the impacts of artificial general intelligence, gradually take into use universal basic income systems, and promote self-employment. This scenario is akin to all four Neo-Carbon scenarios but comes closest to the New Consciousness scenario, as both of them emphasise a general artificial intelligence, self-employment, and self-actualisation.

The three MP scenarios plus previous research and analysis has been given to the Millennium Project Node Chairs in each MP Node country to help create national long-range strategic planning workshops. This is an ideal opportunity to use MP scenarios and reflect them on local and regional levels. Thus, rich combinations of ideas and debate could bring about beneficial innovations and practice for improving the field of work, employment and industries in different countries.

The second reason for including the MP scenarios here in this report, and tentatively presented already in the Futures Clinique, is that Finland has started preparing its government foresight report on the topic "Work in Transition".[17] We would strongly recommend to organise such a national strategic workshop in Finland as mentioned above where the results of the MP study were taken into attention and elaborated and debated from the Finnish national point of view. Such a synergy should not be wasted. Many MP Nodes have already organised such a national workshop, for example Spain, South Korea, Italy, Greece, Brazil, Israel, Germany, and Argentina.[18]

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[17] Finnish government makes a government foresight report in every election period, which is then submitted to Parliament. The Committee for the Future then gives its comments on the report.
[18] Such a national workshop would support the foresight report work at Prime Minister's Office. The Committee for the Future could also be a relevant stakeholder in organising such a workshop. Any other organisations and even companies might also join forces for this effort. FFRC and Helsinki Node of the Millennium Project would naturally help to organise the workshop.

4. FUTURES CLINIQUE RESULTS

On April 13th 2016 in Helsinki, a Futures Clinique was held to probe the futures of work in a 2050 world of automation and distributed, low-cost renewable energy. The year 2050 was chosen as it is the timeframe for the Neo-Carbon Energy project, distant enough in the future so that the effects of automation and renewable energy have had time to settle. Around 40 experts from different backgrounds – researchers, officials, company representatives, and students – participated in the event. Many of the experts had background in energy research and business, but there were also experts e.g. on work life and media startups. Students had background in engineering, business, and futures studies. The wide background of participants aimed at analysing the futures of work from as many perspectives as possible. However, the composition of the participants was biased in the sense that there were no unemployed participants. All the participants can be socio-economically described as "middle or upper middle class" and as employed in expert occupations.

There were five groups, each of which worked on one of the Neo-Carbon scenarios described in chapter 3.1 (for full scenarios, see Heinonen et al. 2016). For the New Consciousness scenario there were two groups as this was the most popular scenario among participants, and those who wanted to work with this scenario had to form two groups. The participants were sent a short description of their group's scenario beforehand.

Figure 7. Futures Clinique comprised interactive group working and shared sessions. (Photo: Sirkka Heinonen)

Three foresight methods were used in the Futures Clinique: Futures Wheel, Futures Image, and Futures Table. This article presents the results of the Futures Wheel session, which was the main method in probing the futures of work in the groups' scenarios. Futures Wheel is a mindmap like tool developed by Jerome C. Glenn of the Millennium Project (for more information on the method see Glenn (2009). The Futures Wheel was chosen as the main method for this Futures Clinique, because it enables coming up with new ideas on the theme in a cooperative and flexible manner. The Futures Image and the Futures Table were chosen to encapsulate and elaborate the core idea from the Futures Wheel. The Futures Wheel consists of two consecutive circles. The use of the circles can be modified according to the needs in each case. Ideas are written on post it pads, which are then placed on the circles of the wheel. In this futures workshops the group work began from the centre of the wheel, where each group member wrote their personal ideas on ideal work in the group's scenario and presented them to others. This outlined preferred futures of work. Next, the groups discussed what work could be like in the given scenario's future, in both positive and negative aspects. The ideas were placed on the inner circle of the wheel. This depicted possible futures of work. After finishing the inner circle, the group discussed and came up with possible consequences of the work they had anticipated in previous phases, for instance as concrete products, organisation models, companies etc. These ideas were compiled on the outer circle of the Futures Wheel.

Because usually not all ideas presented in futures workshops end up written, each group's discussions were recorded. After the event, the moderators transcribed the discussions on a Word document. In the following the transcribed results of the futures wheels are classified into seven categories and synthesised as a projection of the future of work. All the ideas presented in the following are from the Futures Clinique have been compiled and interpreted as a cohesive text. Hence this article offers a methodological advancement to futures workshops. Often the problem of futures workshops is that they present a plethora of disconnected ideas. This article shows how the ideas can be combined as a comprehensible whole by first documenting all the ideas as transcribed text – not only as post its, which often leave crucial points of view out as the space of a post it is limited – and then refining and synthesising the ideas by writing them as a futures projection. In this article the concept of futures projection is introduced and experimented as a description with similarities to Futures Image, but with more room for alternative and even controversial elements within the text. In the classification and analysis the different phases of the Futures Wheel are not treated as separate. Thus, to provide a comprehensive view, the futures projection includes elements from possible and preferred, as well as non-preferred futures.

For the purposes of this report, the main results of each group work in the Futures Clinique were synthesised into a **collective futures projection on a possible future of work in 2050** (chapter 4.1). Seven themes were distinguished, making an entity of futures projection "Peer-to-peer Work in the Digital Meanings Society 2050". Each group in the Futures Clinique also synthesised their results as a

collective futures image. Summaries of each futures image are thus also presented (chapter 4.2). The full results of the five groups working in three sessions using various foresight tools are finally documented and presented below (chapters 4.3–4.7).
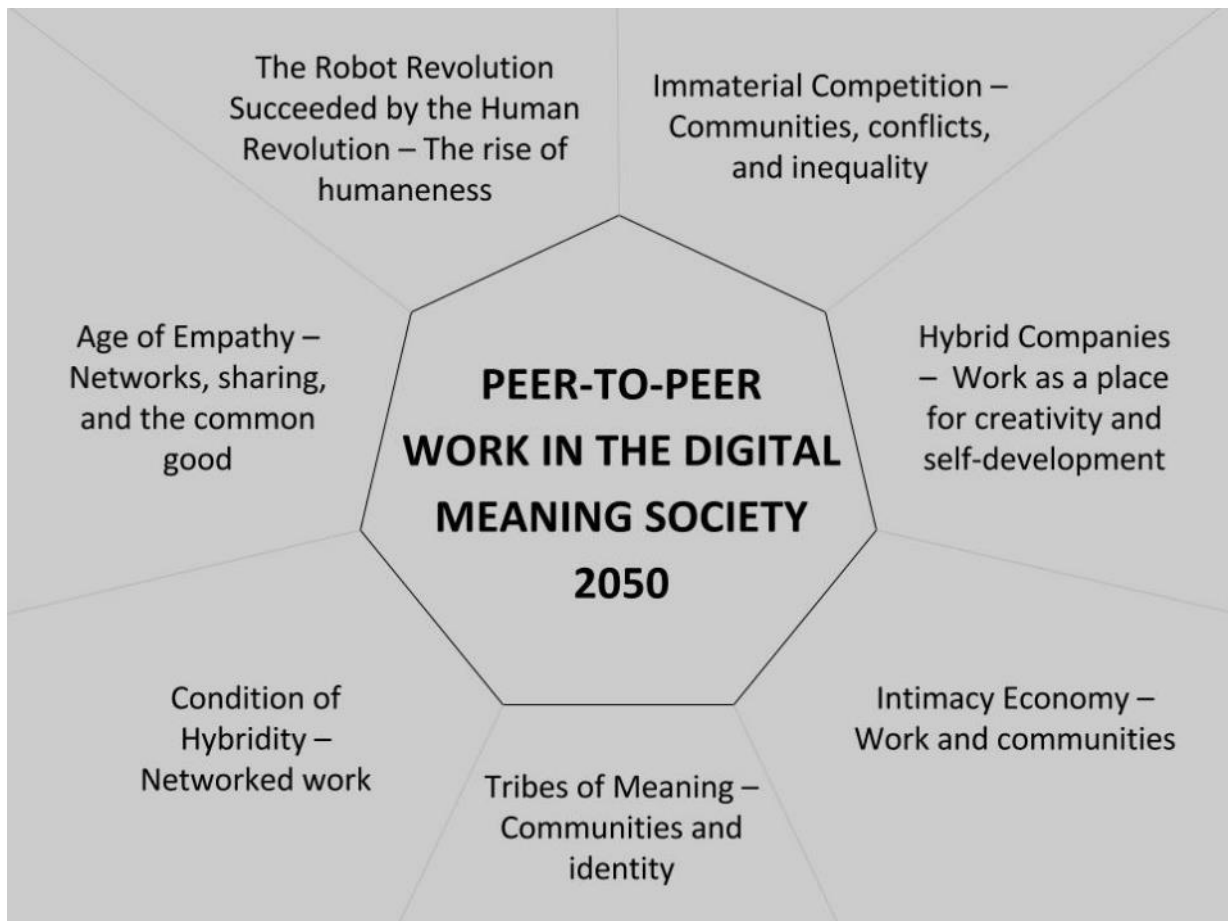
Figure 8. Seven themes arose from a synthesis of the Futures Clinique results.

4.1 Futures Projection on a possible future of work 2050 – a synthesis of the Futures Clinique results

Hybrid Companies – Work as a place for creativity and self-development

If robots took care of most of the material production and menial jobs, work done by humans would fundamentally change its nature by moving towards the high-end of Maslow's hierarchy of needs – i.e. towards creativity and belonging. Instead of material needs, such work would satisfy first and foremost those of self-actualization and self-expression. In an ideal situation work would be meaningful, creative, and purposeful, and a source of experiences and self-development. It would allow constant learning, and tasks would be modified as one develops. No sharp division between work and leisure would

exist, and a person would be seen as an individual and a human being also when he or she is working, instead of a cog in the wheel.

Creative work of self-development would be built from the bottom-up. Management would be replaced by self-management. Workers would be internally motivated, and the role of managers would be to help workers reaching their potentials and personal goals. Companies' values would reflect those of their workers, not vice versa. Like individuals, enterprises would pursue other goals than profits only. Companies would be partly freed from the requirements of the market, as new kinds of "free enterprises". Instead of contradictory, doing good and making a profit would be seen as complementing each other. Businesses would be more like adventurous test labs and condensations of intellectual, social, and economic resources, rather than profit-maximising entities of today.

Work in such companies would require workers to self-define their jobs. Only thus could work correspond with citizen's personality, gifts and interests. This implies that supply creates demand, not the other way around. Production according to demand would not be truly independent. Instead, people would do their "own thing" manifesting their personality, and trust that resulting "authentic" products would find their markets. A pivotal skill in this kind of a world would be to find one's thing. However, those who are not able to self-define their work would easily become marginalised.

Although the kind of work described above seems highly individualised, perhaps its most fundamental feature would not be individualisation, but the rise of communities. Individuality and creativity stem from social relations and a shared culture. To maximise their creativity, people would work at the same time independently and with others, learning from each other, and establishing ad hoc teams according to changing needs and preferences. Work would provide experiences not only for oneself, but for one's acquaintances and communities as well. When everyone does things they do best and express their individuality through work, they also contribute for the common good.

Intimacy Economy – Work and communities

If work became first and foremost self-expression, organisations would consequently be replaced by communities, as they offer better possibilities for individuals to self-define their jobs. The separation between the different spheres of life and the sectors of society would wither away, at least to some degree. Work and leisure, private and public, and an individual and the community would merge together as an organic whole. Individuals and communities would thus become the units of exchange instead of organisations. A traditional work-community would transform into a leisure-like community or a "community of passion". Work would be done and developed together. Belonging to a community or a company might even be one's right as a citizen – you are born into, for instance, a community-like startup.

Producers and consumers would have a shared lifeworld. There would be a personal, creative bond between the provider and the so-called customer. Work would be mutual co-creation between workers and customers. Demand would define supply in much more intricate ways than today.

An artificial intelligence or different algorithms could be enablers for work that is at the same time individualistic and collective. In practice this could mean for example a platform that connects individuals with the same interest, tastes, goals etc. with each other – enabling, for instance, a community for the curious. Such platforms would allow flexible forms of occupation. At different stages of life an individual could be an employee, an employer, a freelancer, and everything in between, also working flexibly in different industries.

Tribes of Meaning – Communities and identity

The kind of "community work" described above would not serve the purposes of production and self-development only, but would also help individuals to construct identities in a meaningful way. In the future, identities, meaning and purpose could be based first and foremost on different communities, and on work done at these communities. Different communities could for instance provide a "personal mission" for individuals, as a basis for a stable and constant identity.

Identities are becoming problematic especially due to two reasons. On one hand, traditional and stable sources of identity – such as a well-established, professional occupations – are eroding, and on the other hand, different sources of identity are endless, especially due to the cultural influences offered on the internet. Identity thus needs something new and solid to be based on. In the future, identities, meaning and purpose could be based first and foremost on different communities, and on work done at these communities.

Communities have two advances that make them desirable regarding identity construction. First, communities allow identity flexibility, as communities, forms of employment, and occupations would change in time according to changes in individuals' preferences. Second, communities allow people to anchor their identities on something solid, as communities offer more stability than information flows of the internet.

The rise of communities would probably not mean a return to uniform cultures. On the contrary, as citizens would co-create their communities and corresponding identities, culture would become much more diverse than today. Freedom to consume what one wants could transform as freedom to choose one's way of life. People would not belong to one or a few communities only, but to many different and constantly changing ones. Different media, in turn, could specialise to serve different communities, and identities of individuals and media could enmesh. Media would have their own distinct voices to which different individuals could relate to according to their own tastes, ideas and values.

Once again, a person's ability to "know thyself" would be emphasised.[19] One's personality would steer him or her to choose certain communities and influences over others. This assumes that people know what they want from their lives in the first place. Life-coaching could thus become immensely important – life coaches could even transform as "priests of the future", replacing religious figures by secular spiritual guides.

Regardless of the relative continuity offered by communities, a networked, peer-to-peer world would probably be more chaotic and more in flux than the present world. This could lead many to yearn for stable and tight communities, instead of constantly changing ones. Perhaps most would like to skip between communities, but some could want to belong to something permanent and clearly bounded. The yearn for stability could lead to "bubbles" within which individuals would socialise only with the like-minded and shut the rest of the world outside. Another possibility is that local communities would be replaced by a "global village", a cosmopolitan identity, or even by some kind of new world religion. A global identity could offer the base on which different micro-identities would be tied together.

Condition of Hybridity – Networked work

If communities were the basic units of new work, the general organisation model for work could be provided by networks. Rigid bureaucracies would be replaced by organic, porous network structures, and different communities would be linked together by interlocking networks. Resources would be shared within networks: workspaces, tools, information, et cetera. Sharing could be global, local and regional. This is because new technologies are so complex and are needed globally, for instance to tackle climate change, that they require global development efforts and global distribution.

Glocal (global and local) networks could mitigate the "sectarian" tendencies of close-knit communities as the structure through which people could swap between different communities. Networks would make communities and collaboration more diverse. Networks would be open, and allow working where, when, how, and with whom one wants. In other words, networks would ensure that individuals retain the freedom to choose for themselves and not be embraced by their communities too dearly. Then again, networks would dissolve those very structures – such as nation states – whose loss make people want to belong to "closed" communities in the first place. The fact that networks dissolve clearly defined boundaries could be deemed problematic in other ways as well. Because networks

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[19] Renown futures researchers Jim Dator and Jerome Glenn emphasis knowledge of oneself as a specially required skill in the future working life. See e.g. their video interviews (2 videos on Dator's thoughts, and 3 videos on Glenn's) on the website of our Future of Media and Communications (FMC) research group
https://sites.google.com/site/futuremediac/videos--presentations

would spread virtually everywhere and cover every sphere of life, work and leisure might become inseparable even though people would sometimes prefer keeping them separate.

Age of Empathy – Networks, sharing, and the common good

If material production was highly automated, people would not have to work as much as today to earn their living – if, for instance, universal basic income guaranteed the basic standards of living. This would create a fertile ground for altruism and sharing. Doing good and working for others could be an option to paid labour as a source of meaningful activities.

In a world of sharing and networks, money and other resources might be partly redefined as possessions of the network instead of private property. Furthermore, value would not be understood only as monetary, but as e.g. ethical, aesthetic, cultural and social value as well. The successful ones would want also others to succeed because networks and communities had enabled their success in the first place. Once one has earned enough money, he or she may donate at least some of it away to help others. Networks and communities could also provide a safety net in times of hardship, resembling social arrangements in the "developing countries", where a person who earns money often finances his or her community. There would be solidarity in networks that seems foreign to traditional notions of competition. Networks would function more on principles of open source than property rights. Growth would be seen as sharing and spreading of capital instead of its private accumulation. In an ideal situation resources would be allocated so that more creative human potential could be harnessed, instead of keeping them in the hands of a few.

A successful entrepreneur would be a kind of a hero, who brings tax income and other value to the society. Such "hero entrepreneurs" would be a nexus around which communities and networks would evolve. Money would not be the main motivation for success, but instead e.g. acquiring deep knowledge and reaching ethical goals. Entrepreneurs of this kind would not focus on developing "a new camera app", but on solving the world's problems and providing for the common good. The incentives for such efforts would again probably not be material, but for example prestige, social connections, and pure altruism. People would also choose where to work according to values and goals they consider important, not according to monetary compensation.

Situation of this kind would redefine wage. Work would not be seen as means for subsistence but as "general labour" – comprising of all creative acts. Compensation of a more social work would also steer towards more social conceptions. People would seek spiritual and social fulfillment instead of material rewards. To be respected is a basic human need that cannot be satisfied through material compensation. "Wage" could be, for instance, quantified social status or social capital (social media "likes" as a rudimentary, present example). Belonging to a desirable (work) community and the opportunity for meaningful work could often be a sufficient compensation in itself. People would mostly be involved in tasks they would do voluntarily and out of passion, regardless of payment.

Work could thus be divided in two: half of the time people would work as paid labour, and half of the time in sharing economy and voluntary work. Enterprises could also take part in the sharing economy – the whole economy could at least to some degree be based on bartering, with no monetary transactions. If people had plenty of meaningful activity, they might even not want material things as they do today. A virtuous circle might thereby emerge: when people receive help from others, they also want to give back.

A major question is what should happen so that a post-money world were possible. What is the path from today to this kind of future? How does economic competition function and how would value be created in this kind of world?

The Robot Revolution Succeeded by the Human Revolution – The rise of humaneness

An interesting theme that emerged in the Futures Clinique was the simultaneous emphasis and down-playing of the role of technology. Future society was seen as thoroughly technologised. However, technology would be integrated seamlessly into environment so that it would be "discreet" and mostly invisible. Technology would become more independent so that it would work in the background without a need for human intervention. This would free people to interact with each other instead of machines. Furthermore, due to the development of artificial intelligence, technology would transform as less mechanistic and more human-like. Technology would be able to learn by itself and people could communicate with technology in the same way they communicate with each other. Our relationship with technology could thus become more intimate and effortless than today.

As machines would automate many tasks done today by us, humans would be freed to use and develop their human skills, those which machines would not yet possess. "The revolution of robots" could be succeeded by "the revolution of humans". Creativity and social intelligence would become even more pivotal than today. Emotion, empathy, and interaction would be emphasised. Humans would ask questions, set goals, and invent new needs, and the role of robots would be to help realising these plans. This would be a kind of a "back to nature" future in which humans would cultivate those very attributes that make us human.

Immaterial Competition – Communities, conflicts, and inequality

The emerging automated peer-to-peer future would probably have its own social problems and ine-qualities. If the economy, for instance, was built strongly on startups, people would have a low entry point to start their own business or to join a fledgling company. This could mitigate unemployment and distribute wellbeing in an equal way. However, the system could be harsh on those who do not assimilate in the startup culture requiring "successful" and high-performing individuals. If an individual was for any reason unable to succeed, he or she might easily become marginalised. Furthermore, in a

society revolving around startups and other "community companies", the companies provide a community, and communities are often the way into the companies – it is a chicken-or-egg situation where those outside startups and other companies would be in an inferior position to become members of a thriving community.

Unequal positions apply to communities as well. In the future of multitudes of groups one belongs to, people may not be in unequal positions as individuals but according to their communities. Competition between communities may intensify in a world of free information flows and global competition. Specialisation would thus become even more crucial than today, requiring communities to hone their skills as better than other communities.

Specialisation requires the division of labour. If the division of labour proceeds, society would become more plural than today. Tastes, ideas, and values would become more progressively diversified. A peer-to-peer society would thus be more fragmented than today. However, in such a society people would be more dependent of each other as well. The more communities, companies, and networks specialise, the more they need to exchange products and services. This creates "organic solidarity" that binds the fragmented society together.

Despite codependency, a fragmented society might pose new societal challenges. If the world is divided into numerous networks and communities, can a consensus on how society should work be achieved? Tribes enabled by social media may erode the role of industrial institutions, such as the judicial system and the mass media. People have forgotten "the dark" side of communities and tribes, such as sectarian narrow-mindedness and unfairness towards other communities or tribes. A positive future in this respect could be a fusion of "traditional" communities or tribes and modern institutions, combining the best elements from both.

As a result of a shattered public sphere, expert knowledge and authorities can lose their power and status. Each community and network could have their own notions, knowledge, and morals. Traditional media as gatekeepers and definers of the truth would be subverted by individuals communicating with each other directly. Disinformation might spread more rapidly and have various adverse effects in this post-truth world. Some groups might even seek to dominate others, for instance by using means of information warfare or by programming malevolent robots.

In a world of material and energy abundance the current competition of economic status might become meaningless. This, however, does not mean that competition will vanish. Perhaps people would compete on cultural and social capital? Those with the most refined taste and best social relations would be the new elite. Success requires that one is autonomous, active, and self-imposed – is able to manage one's life, understands what he or she wants, and knows one´s strengths. Those with the most knowledge – including knowledge about oneself – would thrive the best. This applies to communities as well as individuals. Social and cultural inequality can also manifest itself as "qualitative

unemployment" in the sense that the not-so-well-off would have to work in jobs that do not allow self-expression and satisfying other "higher" needs.

People often seek emotional security from tight communities. If the world becomes increasingly chaotic and insecure due to fragmentation of culture and values, religious fanaticism can become alluring for many. Fundamental religious views could offer a solid, unchallenged base on which to build one's life. A less radical alternative is the rise of "gurus", religious or otherwise. In economic communities, for instance, a charismatic character may become the centre around whom the community revolves and develops. Besides economic security, people would seek emotional security from such persons. Thus, in practice power may not be as evenly distributed as people today tend to think of grassroots organisations.

4.2   Summaries of the groups' Futures Images

In the following, the Futures Image generated by each of the working groups in the Futures Clinique is presented in a nutshell. The full descriptions of the process are documented in the next chapter, presenting the whole working process of each group: firstly the results of Futures Wheel, secondly the Futures Image and thirdly the ACTVODE Table.

Group 1: Startup Citizenship 2050

Everyone is a citizen of a startup. Startup is a tight mini community around you, and it is defined by specialisation. The surrounding community offers security, as the members are taken care of. The society is tribalised, and some communities may even be close to religious groups. However, they operate in an open way, and share knowledge with other communities. The meaning of profit has turned upside down. Instead of a company with a high growth potential a startup in 2050 is a company with no growth potential. The main motivation to work is to share the profit with the community. Big companies do still exist, but the tasks within them are mostly ran by robots. Also, some project-based startups exist within these big companies.

Group 2: Platform Nordic 2050

Corporate communities, as platforms, are a novel manifestation of states. Platforms are where resources flow and are shared. Finland is an ethical corporation / platform economy, and the entire Nordic region is seen as a single, platform-like corporate community. With clever and ethical algorithms, Finland is a world leader in the sharing economy. Novel technologies and AI enable the platform to function in an optimal way as a systemic entity.

Group 3: Local Communities in Global Village 2050

In a Do-It-Yourself village robots are executing all the mundane work tasks. The need for individual people to travel and commute to work is diminishing in a small scale community. Access to knowledge becomes a vital factor as there are expected to emerge both excess and shortages of resources. However, the renewable resources are replacing the non-renewable ones.

Group 4: Post-Sisu Society 2050

Finland is a "Post-Sisu Society". *Sisu* is a Finnish word for willpower, guts and determination regardless of costs. Alas, culture soaked in *sisu* can sometimes be harsh and unforgiving. Thus, in *post-sisu society* the Finnish culture has become more gentle, playful, open-minded, and relaxed. Social relations have become more networked and communal. With its strong educational heritage and tradition, Finland has spearheaded the global shift towards the era of the "new enlightenment" by becoming a country of science, arts and culture. Traditional *sisu* is mitigated by curiosity and a culture of experiments, and by leisurely thinking instead of the ethos of hard work. Global competition and division of work requires specialisation. Peers and communities provide services and products to each other, and communities' values and ideas are refined as products and services.

Group 5: Uber-connected, or There are two sides to every brain 2050

Society is almost too connected. Work is based on freelancing, which is quite demanding on the individual. There is no retirement – unless the basic income is enough to live on – and since there is no labour in the old sense, there are also no labour unions to speak for those in the working life. Society and education is based on life-long learning, peer-to-peer education and sharing of knowledge. As robots do all the menial work, people can focus on the things they want to do, which leads to specialisation. People have time and means to explore and experiment with various things and issues, so offices are actually more like laboratories. Online and brain-to-brain communication are quite tasking on the human brain. People must keep adapting to the constant new technologies and the new social structures evolving through them. The number of brain burn-out treatment professionals has boomed. There are two sides to every brain: on the one hand, speed is valued – everything is instant and online – but on the other hand, there are also opportunities to do work more slowly, as the basic income works as a buffer for sustenance.

Figure 9. Futures Images were presented and cross-fertilised at the end of the Futures Clinique. Group 1 presenting their Futures Image. (Photo: Sirkka Heinonen)

4.3 Group 1 Results for Startup Communities

The Futures Wheel

Startup communities – Group 1

Religious leaders → affluence (Gurus)

What is left outside? - Big companies

Phase 1

1. Financial success as the measurement of value
2. Success is divided with everyone

Medals and likes as wage

A new perception: for example profoundness appreciated

Ethicalness

Isolation, no encounters between different groups of people

Mental wage? The meaning of money?

Communality = culture of sharing

Ambition

Endeavours for power vs. flat hierarchy

I research clothing and smart materials from a lifestyle point of view in a startup company. How can one produce energy with material as comfortably as possible?

Venture Capital Hunter → If the economy revolves around startups, also funding needs to be sought. Based on the seeking and negotiating of virtual capital

What is the power within the information world like?

Success is shared because people want to be respected

Interphase (before 2050): The meaning of money increases? Success/hero, surrounded by a community

Basic income → motivates to do good

"Demand researcher/hunter/inventor"

1. Human needs mostly catered with automatization
2. We are left with the role of asking/demanding
3. Questions need to be asked
4. Someone has to gather them and invent
From a corporate point of view: Continuously renewing fulfilment of needs, not just a master of one product/service

HR 2050
- Work community coach
- Corporate in house HR coach
- Organisational in-house HR futurist

The motivation of startups:
- Respect?
- Many kinds of motivations?
- App or a better world?

Good social relationships valued

The creative capacity of people used in its full potential

No fighting for subsistence → affording to think about other things

Qualitative description of the job: Private (personal) creative connection with the so-called client ≈ "developing" together

→ Dialogicality Connecting people, Increasing empathy (accomplishments) Societal impact Freedom, flexibility, security (own work) Strengthening trust in society

Communality/ community matters

The meaning vs. insignificance of money → binary?

Regarding the organisation of work: 1st, 2nd, and 3rd sectors combine into 4th sector according to the society's needs. "Sectory of cooperation"

- Inspiring
- Freedom, sufficient compensation enough for moderate standard of living
- Meaningful
- Merging of work and leisure: threath and possibility

Individualisation

The relationship between work and leisure: Working even though it is not paid of

Flat hierarchy vs. inequality (within start-ups?)

Publicity

Definition of growth? Homogenising of well-being? → People --- System - Within or outside the structures?

Motive: gratitude

Some work, some go and express themselves

What is money used for?

Social capital > money, how is it measured?

FB likes as currency

Motive: Doing what you like

Startupizenship/ Startup citizenship

→ No inequality

Now: a lottery → it can be shared from

Now: Small elite - If everyone participates, who is it done for?

Group members:
Elina Kiiski Kataja, Osmo Kuusi, Elina Salminen, Janne Salovaara, Iris Sandelin, Lassi Similä ja Anne Väätäinen
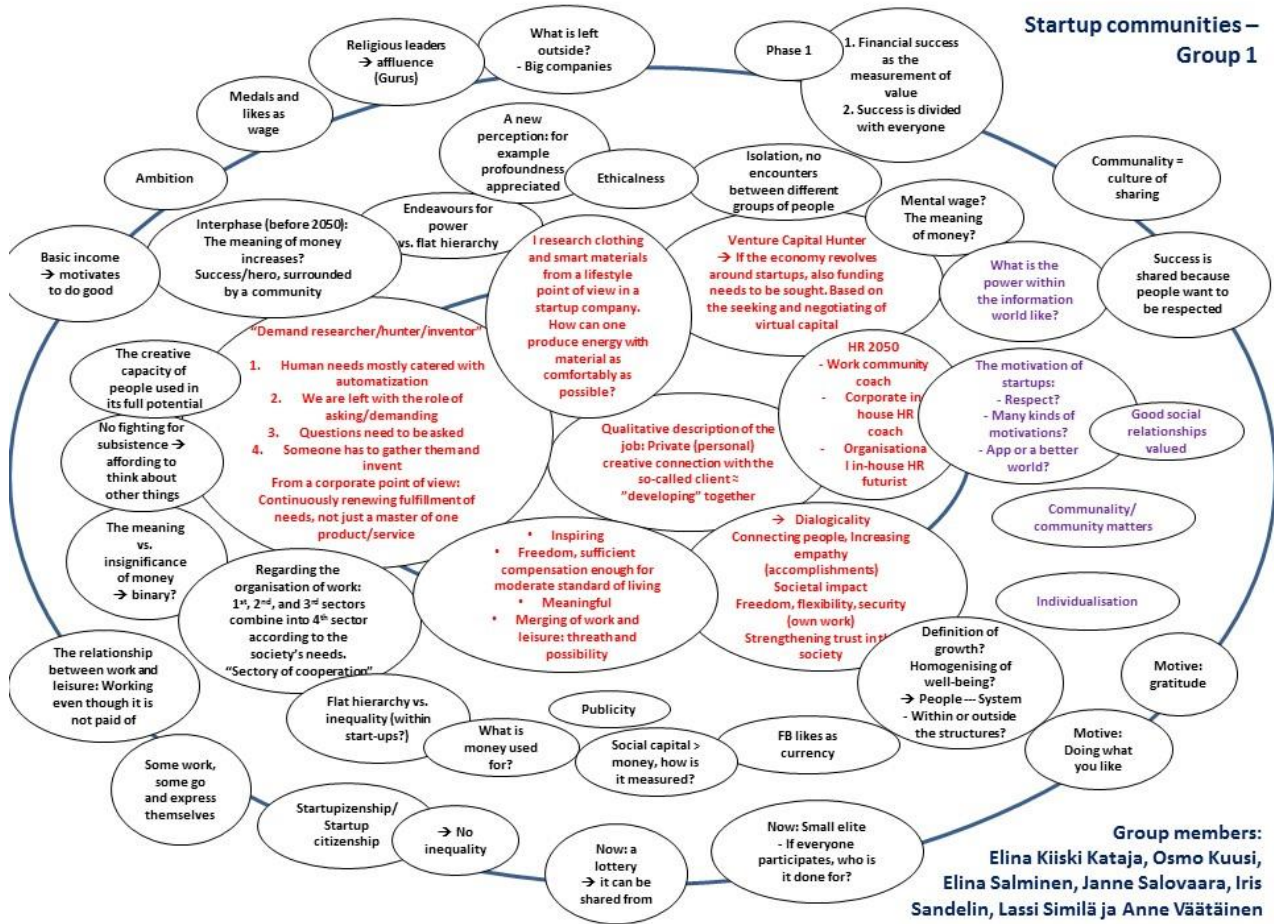
Figure 3. Futures Wheel generated by group 1 for Startup communities.

The first step of the Futures Wheel was to produce ideas on the ideal work in 2050 in a world that is organised around startup communities. These ideas are illustrated in the centre of the wheel above in colour red. The ideal work is **free, inspiring, and meaningful**. The jobs described by the participants were connected to matchmaking, venture hunting, robotics and AI, as well as personal relations, human resources, and empathy. **The venture capital hunter** matches startups and funders virtually regardless of the unit of exchange. **Creating a personal connection** co-creatively with the client was seen to lie at the core of startup communities, as well as **personal HR coaches or HR futurists.** No matter who encounters who, humans or AI, there is a demand for a person **connecting and increasing empathy between actors.** Automatisation and robotisation has resulted in a situation, where machines learn, and humans are left with **the task of asking the right questions**. This calls for **a supervisor of ethical behaviour of AI and robots.**

Figure 10. Group 1 starting their work with Futures Wheel. (Photo: Sirkka Heinonen)

In the following phase the group discussed what the work within the startup communities in 2050 could be like. The discussion revolved especially around the topics of **communities, communality, and the nature of work and payment**. One central question throughout the session was, **what is work and what is considered as work** in a society organised around startup communities. One possibility is, that there are **two kinds of work. Firstly labour jobs within public sector** exist. These jobs are related with **monetary income**. Secondly there are **community-centered meaningful jobs with a different** economy, where **intellectual or social capital prevail.** Instead of money, the **wage/reward comprises of appreciation and the primus motor is to be respected.** Furthermore, **basic income will have an impact on this** balance. As the basic needs covered, people are free to use their capacity in what they really want to do. This results in **gratitude and sharing of the benefits.** Basic income also further **supports the meaning of communities**, as the concepts entrepreneurship and employment would mix.

Community and communality matter greatly, and they become the **source of meaningfulness.** Until this day job has been an important part of **identity and its definition.** Along with the industrialisation, modern states and institution have set the humanity free from local communities and families. In 2050 **people are freer to choose their community.** Regardless, **the community defines the value of the individual.** The need to be surrounded with a community is connected **with the feeling of insecurity.**

As a result of the cross impact of meaningless work and the importance of the community the economic systems have altered. **Profit and wage are not as important as sharing with the community and helping others to succeed as well.** The goal is to **give back to the supporting community.** Communality is realised as a culture of sharing. **If someone succeeds, the success is shared.** Work

is based on openness and sharing. Startups **distribute their wellbeing for the community, and there is no need for scaling.**

Startup companies provide a community and simultaneously the community may function as a gate to a startup company. Everyone is a startup citizen. Communities may be born around strong persons as well, reminding of religious groups and gurus. The emphasis on self-actualisation may lead to a situation, where some people abandon the economic system completely and get spiritual reward for doing what they really want.

However, before this, there was a phase were the meaning of money increased, as it was a signification of success or progress. In 2030s there was a paradigm shift, and **deep knowledge and ethics started to be valued.** Before, startup culture was in the hands of few. **In 2050 everyone is involved.** Furthermore, **it was widely agreed that social relationships matter greatly.** Startups no more aim for high growth. If their business becomes big they sell it to existing giant companies, and start anew. Some startups concentrate on traditional technical questions, but a **number of startups concentrate on wicked problems** with help from machines and full capacity.

The question of **inequality** was also raised. As nowadays startup entrepreneurship means that you are capable to do it, a society where everyone is part of startups, **needs to consider how to include those unable to participate.** Inequality was stated to exist, when one can compare oneself to other people. In a world of communities with flat hierarchy, comparison is not needed. This is connected to the idea that **somewhat isolated communities** do not interact with each other too much.

One driver is the use of **communication technologies** that helps to build **immersive connections** with people on the other side of the globe. **Efficient translators** enable fluent communication. As a result of automatisation humans could be **free from work**, but paradoxically the current tendency seems to lead towards a world, where **work is omnipresent.** The idea state would be to **do meaningful things, but with more freetime.** In the name of cooperation, **first, second, and third sector are combined as fourth sector.**

Futures Image: Startup Citizenship

The future image produced by the group described a situation, where **everyone is a citizen of a startup.** The startup where one belongs is a **tight mini community** around you, and it is **defined by specialization.** The surrounding community **offers security**, as the members are taken care of. The society is tribalised, and some communities may even be close to **religious groups.** However, they operate in an **open way**, and **share knowledge** with other communities. The **meaning of profit has turned upside down.** Instead of a company with a high growth potential – a definition of a startup that is in use in 2016 – a startup in 2050 becomes **a company with no growth potential. The main motivation to work is to share the profit with the community. Appreciation, reputation, and status have become the main capital.** Thus **the growth potential is under control.** Many generations are

involved in the startup communities. Job hotels provide security. However, **big companies do still exist,** but the tasks within them are **mostly ran by robots.** Also, **some project-based startups exist within these big companies.**

The ACT VODE Table

The table further describes the vision of the group 1. The key **actor** of the vision is the value-based start-up community, accompanied by science institutions. The role of actors and **customers** are considered to turn upside down, as the actors of the present day become customers of the future and vice versa (C). Work and education **transform** to some extent. Although the concept of nine-to-five or eight-to-four work diminishes, career thinking prevails. Lifelong education enhanced by online learning becomes ever more important. (T) Whereas rationality is a dominant **value** at the present moment, it will be replaced by emotionality, intuition and holistic conceptualisation. Security, sociality, passion and self-actualisation are among other important values. Criticality prevails and becomes institutionalised. Overall, values are valued. (V) There were three **obstacles** listed, all related to power. Firstly technology will decrease the amount of jobs. Secondly the new equal community-based setting may demand giving up benefits already accomplished. Thirdly Finland was seen merely as a part of the global system, which has its own challenges. (O) Tribalisation was seen as a key **driver** for the vision. However, it was questioned, if local communities have values in a global setting. Contrary to the giving up of benefits, some people obtain power along with the new arrangement. (D) was seen as sustainable and autonomous in the vision. Energy system will be arranged in a different very different way. Whereas now energy is produced by factories, in 2050 small companies will be in charge of energy production. It was noted that startups will not organise based on the need to think about energy issues. However, the topic should be considered carefully. (E)

Table 1. The ACTVODE Table by Group 1 for Startup Communities.

ACTVODE	Startup Citizenship (Startup Communities)			
Actors	Science institution?	(Value based) community & startup communities		
Customers/ citizens	Actors and customers flipped upside down	Actors 2016 → customers 2050, and other way around		
Transformation (processes, practices, technologies)	Concept of work (8 am – 4 pm) changes	However, career thinking prevails	Dropping out of education in the 2010s → dominant in 2050 or not?	Online learning in important role, lifelong learning
Values	Security Sociality	2010s: Rationality Startups: Emotionality, intuition, holistic conceptualization	Passion, self-actualisation Values valued	Criticality prevails → instutionalised
Obstacles	Processes in phases: Technology decreases jobs → power issues	Giving up accomplished benefits (giving up power)	Globality/ Challenges of the international environment → Finland just a part of it	
Drivers	Obtaining power	Internationalisation & communality → does the creation of a local community have value?	← Tribalisation	
Energy	Sustainable development Autonomy	Now: Factory produces. In 2050: Small companies produce. Energy system arranged differently	Energy does not have to be thought of/ Someone has to think about it	Startups do not organise based on the need to think about energy issues

4.4   Group 2 Results for Corporate Communities
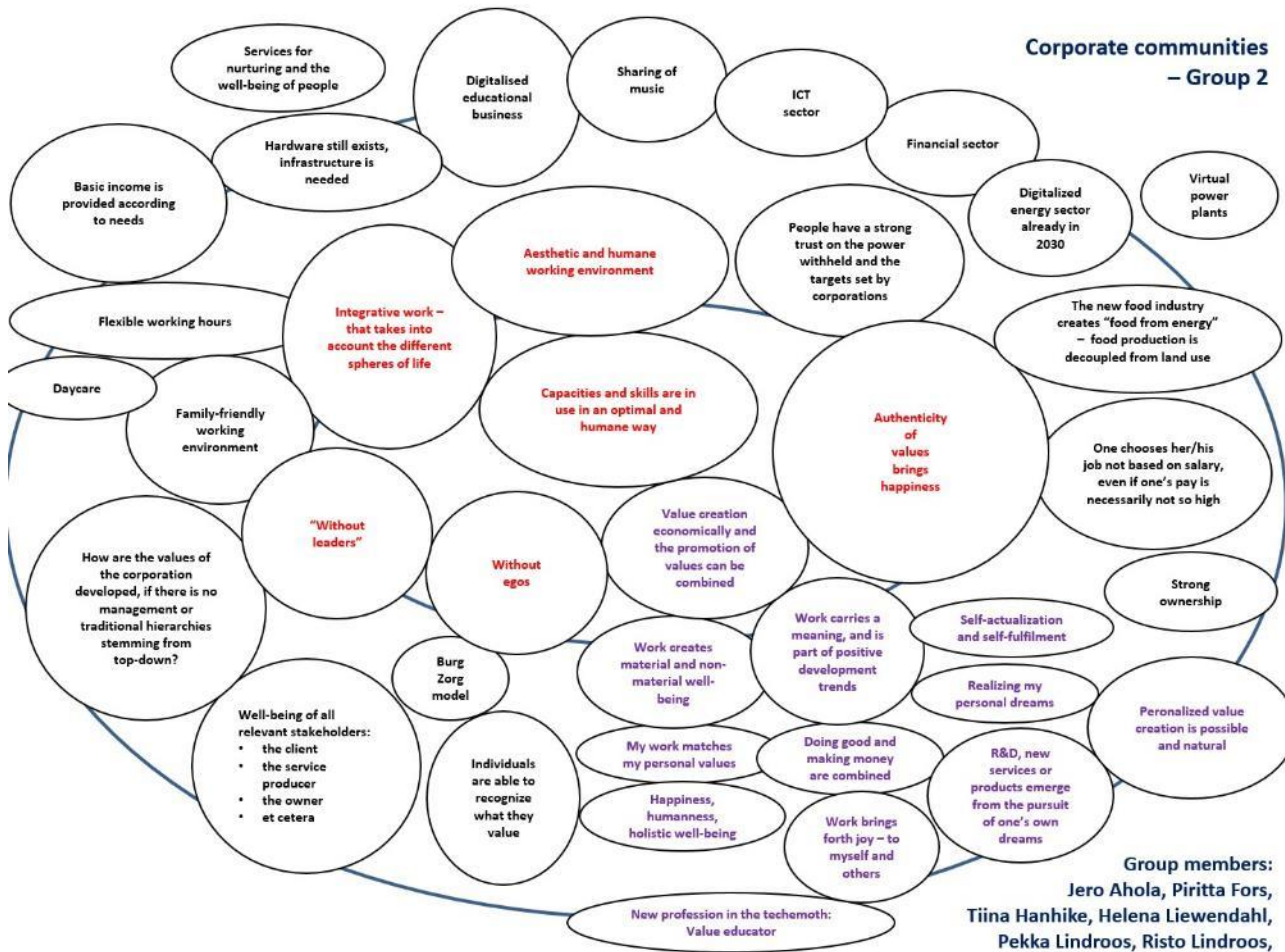
Futures Wheel

Figure 11. Futures Wheel generated by group 2 for Corporate Communities.

In the centre of the Futures Wheel the group members produced ideas about their views on ideal work in a world of value-driven corporate communities (written in red font). The group members saw their ideal work as one where capacities and skills of individuals flourish, and **the values of the employees are put into use through their work**. **Personalised value creation in corporate communities is natural**. Corporate communities consist of flat hierarchies – actions are driven mainly by bottom-up driven initiatives. **Traditional leaders and egos are entirely missing**. In the future, **creating economic value and pursuing well-being merge seamlessly**.

After imagining their ideal work, the group started discussing what the world of corporate communities could be like in 2050.

Because work carries a meaning, it can support positive development trends, and vice versa. In a virtuous cycle, doing good and making money mutually support one another. Values are put into practice and deeply embedded in a corporation's DNA, beyond corporate social responsibility (CSR) as an extension of a company's activities. As an example of an organisation with self-organising work practices, the group analysed the Buurtzorg model in the Netherlands[20]. Buurtzorg is a private healthcare provider that has improved service delivery in the healthcare sector, while improving customer satisfaction and has also been able to pay a higher salary than the public sector. In practice, employees inside value-driven technology corporations and other large companies take initiatives, make experiments, and seek to design and create new products and services that, for instance, help solve the pursuit of an emissions-free future. For instance, an employee in the shipping company would realize his dreams by being allowed to develop a carbon-neutral ship.

As a result, resources in the corporations are used optimally and in a deeply humane way. **The working environment takes into account the different spheres of life of their employees.** The model of companies looking after the well-being of their employees actually resembles the ethos of early corporations in the 20th century. For example in Finland, forest companies, which were led by corporate tycoons, took good care of their employees because there was a scarcity of skilled staff. In the 21st century the context may be different. **Robotisation is feared to reduce the demand of labour** – and a surplus of labour supply is anticipated. Therefore, **a corporation lacks the incentive it used to have to take care of the well-being of its employees**.

On the outermost circle of the futures wheel, the group gathered more concrete ideas about the self-actualising work in a corporate community. Corporate communities were conceptualized as an enabling technological platform. As a platform, a corporate community **boosts collective work practices and holistic thinking**. Aided by technology such as artificial intelligence (AI) and even ethical algorithms further enable holistic thinking. **When AI has morale and feelings**, it can have a much more significant role than it has today. Values such as compassion and empathy are interwoven into corporate practices and sustain the value-drivenness of the community, as has been shown by recent studies by Pessi and others[21].

Throughout the session, the group were wild-guessing how large a share of future economic growth can be expected to derive from digitalisation. Some even posed questions on **what would be the next megatrend that follows digitalisation.** If the platform economy through automatisation is

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[20] Buurtzorg Nederland: A New Perspective on Elder Care in the Netherlands https://www.boomhogeronderwijs.nl/documenten/in_de_pers/9789059316843__artikel_buurtzorg_aarp_international_the_journal_summer_2011.pdf
[21] Research on altruism and compassion, see for instance work by Anne Pessi: https://tuhat.halvi.helsinki.fi/portal/en/person/hiltula

allowed to drive economic and labour policy, inequalities might increase. Therefore, despite the **altruism and benevolence of the new breed of corporate CEOs** who use their companies "to make money and to do good", it may only save the few and the lucky. The group discussed deeply **the dilemma that states currently have with the "platform economy"** driven by multinational corporations such as Google or Apple, as **states receive little tax income**. Large multinational companies minimise tax payments locally through internal financial operations in the corporation. CEOs that take the initial investment risk may later become billionaires. The group members anticipated that **states may struggle to hold such pressure for longer periods of time**. Therefore, even if the services and applications of large corporations can ease human life by addressing certain needs, to justify the power they have, corporations may gain legitimacy from being value-driven, as they seek to **address the needs of the broader society**.

Futures Image: Platform Nordic

In the futures image session ideas were applied and reflected on the Finnish context. The group envisioned a future called "Platform Nordic". *Platform Nordic* is based on the idea that these corporate communities, as platforms, might actually be a novel manifestation of states. Corporations of the year 2050 are platforms where resources flow and are shared. The group primarily emphasised Finland, as an ethical corporation/platform economy, but considering the legacy of welfare societies in Nordic countries, in other occasions referred to the entire Nordic region as a single, platform-like corporate community.

With clever and ethical algorithms, Finland would be a world leader, a pioneer of the sharing economy. Novel technologies and AI would enable the platform to function in an optimal way as a systemic entity. Best practices of work would be shared and a culture of success nurtured. Platform Nordic could export the systems related to complex value-driven concepts such as equality as actual products. The customers could either be other techemoths, or entire developing countries.

ACTVODE Table

The ACTVODE table further describes the Platform Nordic vision. The key actors are Platform Nordic (or if consisting only of Finland: Oy Finland Ab) as the actual platform, and their ethical algorithms, not forgetting the empowered individuals and communities inside them. Robots write news for a renewed media (A). Massive technology companies trade internally, sell their products and services to other techemoths, and to developing countries (C). There are new narratives, the welfare state is being exported across the world, corporations aspire to be better than demanded by law and increased sensitivity *for* transformation. Work practices cherish group work. Practically all fathers take paternal leave (T). Purposefulness is found in one's work, and altruism increases: people feel genuine happiness from the success of others. Compassion, trust and respect are reinforced. (V) Change is driven by self-

actualization and realisation of the potential for change of individuals (D). However, transformation is delayed by the current practices of old corporations and inherited models of leadership. Globalisation, which for long has been allowed to produce socially unjust outcomes, proves to be a major obstacle. (O) Energy production and consumption are also agreed on the platforms. Energy production is de-centralized with solar and wind. Individuals or families are energy independent, and store energy – even hydrogen. Consumed products are based on carbon dioxide – and entirely carbon-neutral (E).

Figure12. Group 2 discussing the ACTVODE Table for Corporate Communities. (Photo: Sirkka Heinonen)

Table 2. The ACTVODE Table by Group 2 for Corporate Communities

ACTVODE	Platform Nordic (Corporate Communities)						
Actors	Platform Nordic	Oy Finland Ab as a platform	Ethical algorithms	Communities – and their individuals	Renewed media		
Customers/ citizens	Developing countries are customers to the value-driven techemoths		Other "techemoths" are also customers	Trade and exchange internally inside the techemoth			
Transformation (processes, practices, technologies)	Export of the "welfare state" concept with its systems, including governance	Sensitivity for transformation	New narratives can enable transformation	Corporations that aspire to be "better" than the legal framework	Group work – no more sitting in classrooms!	Fathers will be on paternal leave	
Values	Compassion	Altruism	Well-being	Purposefulness	Trust	Respect	
Obstacles	Current practices of old corporations	The hegemony of old narratives and stories	Rulers and leadership styles of the 20th century	Globalization that has failed to meet the needs of people			
Drivers	Sensitivity for transformation	Self-awareness and realization of one's own skills and abilities	Regionalism	Seeing the big picture	Writing your own story – the power of emerging narratives	A new vision	
Energy	Distributed energy production based on solar, wind and bioenergy	Platforms of sharing where consumption and production are agreed	Hydrogen economy	Manufacturing of products based on carbon dioxide	Products have net-zero emissions		

4.5   Group 3 Results for Cottage Industry and DIY Communities

Futures Wheel

The core of the Futures Wheel comprised freedom of work according to one's own interests, 0–100% flexible work, DIY working with free schedules, handcrafted and more personified work, multiemployed working, ownership of platforms, energy efficiency and frugal innovations. These were further regrouped in topics such as (a) creativity, flexibility and responsibility issues (b) income from multiple sources (c) robotisation and financing.

The inner circle of the Futures Wheel reflected upon how new technology will be produced, can it be a production without larger corporations, based on development of crowdsourcing and new platforms for repeated production. The latter idea led to futuristic speculations on how one can multiply his/her working performance and how to sell the skills for a platform locally and/or globally. Furthering this line of thought, what will be the winning forms of work and what are the profitable areas of specialisation.
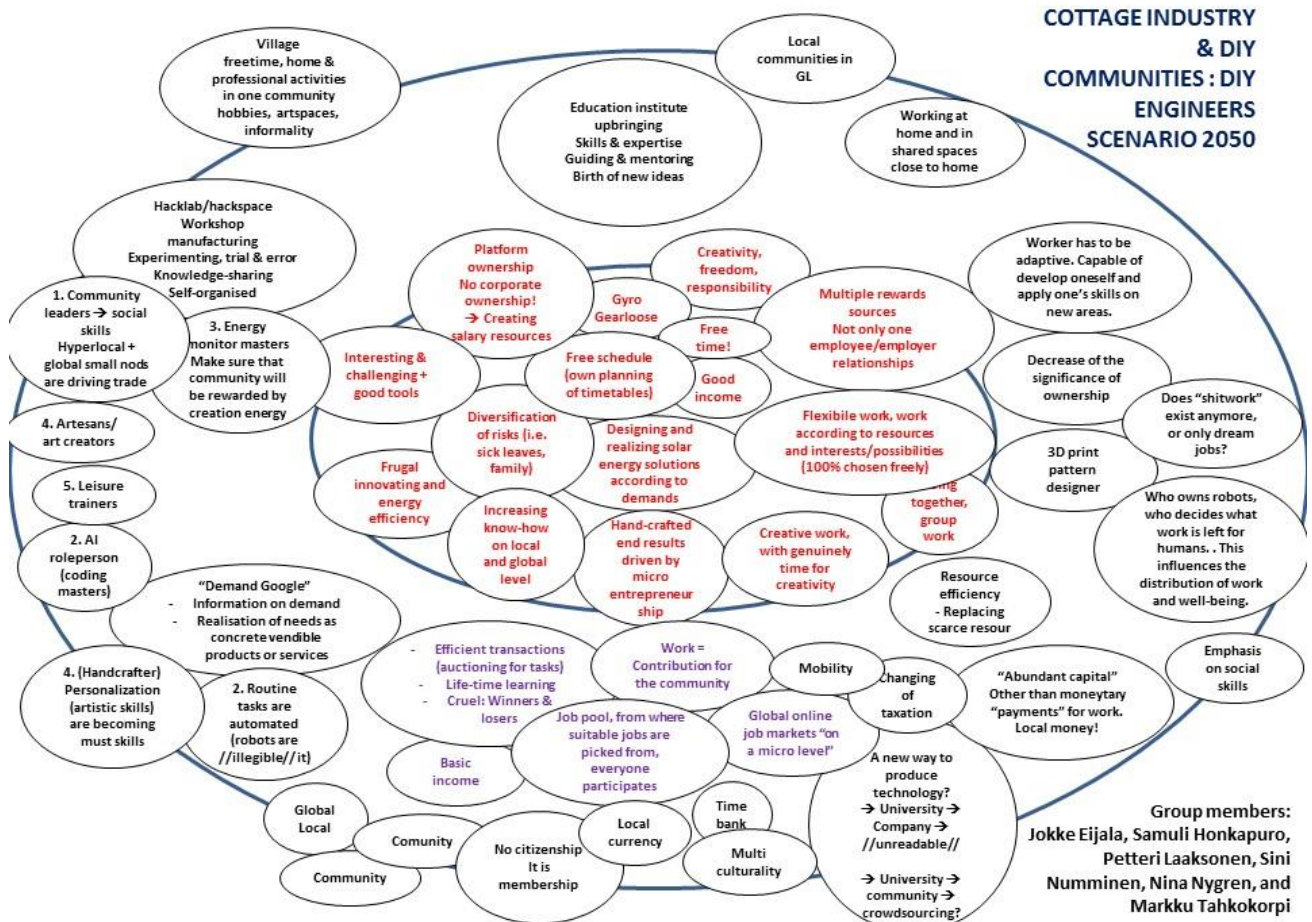
Figure 13. Futures Wheel generated by group 3 for Cottage industry and DIY communities.

For the outer circle of the Futures Wheel the discussions started from the chosen key questions: (1) what is the definition of work in the futures? In 2050, will it be a passion or a labour or doing? (2) what are the mechanisms for distribution of DIY work and wellbeing? In 2050 the profitable solutions may be the new ownership forms of the platforms and pools for labour exchanges. Estimating that the energy production prices will be low so that systems change and there will be better returns to investments emerging from the energy sector. Abundant and inexpensive energy supply makes robotisation affordable and thereafter a village can afford Basic Income as well as Basic Subsistence for all.

Imagining and drawing a potential and preferable futures stage in a village by 2050 resulted in a pictorial sequence of issues related to the new ways of working, doing and owning.

Finally, the major emphasis of the group work was on the energy frame enabling the systematic approach to the functions and sectors of the society in 2050. There were notes on multiple drivers and trends transforming the village into a glocal hub. The break-up of current forms of industrial production, crowdsourcing for investments, individual and collective ownership of platforms, new sustainable tools for energy production and distribution, alternatives ways of auctioning the labour market demands vs. offers (so called Special Google), flexible terms for working hours and leisure hours, all these themes mentioned previously can be seen presenting human capital and collective knowledge for decentralised DIY life in 2050.

Futures Image: Local Communities in Global Village

The visualisation of the group 3 for a workable Futures Image started with an intermitted episode with a stick-figure. The human start-up continued with a graphical presentation of the work day time division for DIY workers' daily alternatives: two pies indicating the time spent on the local or global/glocal work duties. This DIY village view was provided by the situation where robots are executing all the mundane work tasks. A consequence of this was that the need for individual people to travel and commute to work was diminishing in a small scale community. Access to knowledge becomes a vital factor as there are expected to emerge both excess and shortages of resources. However, the renewable energy resources are replacing the non-renewable ones by 2050. After several creative naming-the-pictorial-iterations into a Futures Image for this Group 3 design was finally identified as "Local Communities in Global Village" in order to cover the most relevant ideas discussed.

Figure 14. Group 3 presenting their ACTVODE Table results for Cottage industry and DIY communities. (Photo: Marjukka Parkkinen)

The ACTVODE Table

The key **actors** of the vision were individuals, local community and robots. Furthermore, the owners of robots, infra and platforms were considered important. (A) The concept of **citizen** is replaced by member and membership, and community can be seen as a **customer** (C). **Transformation** occurs in various ways. ICT-based mechanisms transform the way work is distributed. Furthermore, work may not be a proper concept to describe doing or making things in the future. Infrastructure costs are shared and local currencies may be in use. (T) Globality/locality, local democracy and material efficiency are among key **values** (V). The distribution of wellbeing and the lack of meaningful doing were mentioned as **obstacles**. Also the critical mass for a community was mentioned as a possible challenge. (O) Community was also seen as a **driver** alongside with entrepreneurship, local and renewable resources, innovation and meaningful doing (D). **Energy** is produced locally and in a democratic way. Scarce resources are efficiently replaced by abundant renewables.

Table 3. The ACTVODE Table by Group 3 for Cottage Industry and DIY Communities.

ACTVODE	Local Communities in Global Village (Cottage Industry & DIY Communities)			
Actors	Individuals, local community, robots	Owners of robots & infra	Owners of platforms	
Customers/ citizens	Word citizen is wrong → it's all about membership	Community		
Transformation (processes, practices, technologies)	ICT-based mechanisms of distributing work	Is "work" right word to describe future of doing	Sharing of infrastructure costs	Local currency
Values	Global/local	Local democracy	Material efficiency	
Obstacles	Evolution of the distribution of wellbeing	Lack of meaningful doing	Critical mass for a community	
Drivers	Local resources	Renewable resources & innovation	Community	Meaningful doing / Entrepreneurship
Energy	Local & democratic energy production	Resource efficiency - Replacing scarce recourses with abundant renewable energy		

4.6   Group 4 Results for Freelance Economy & Open Collaboration
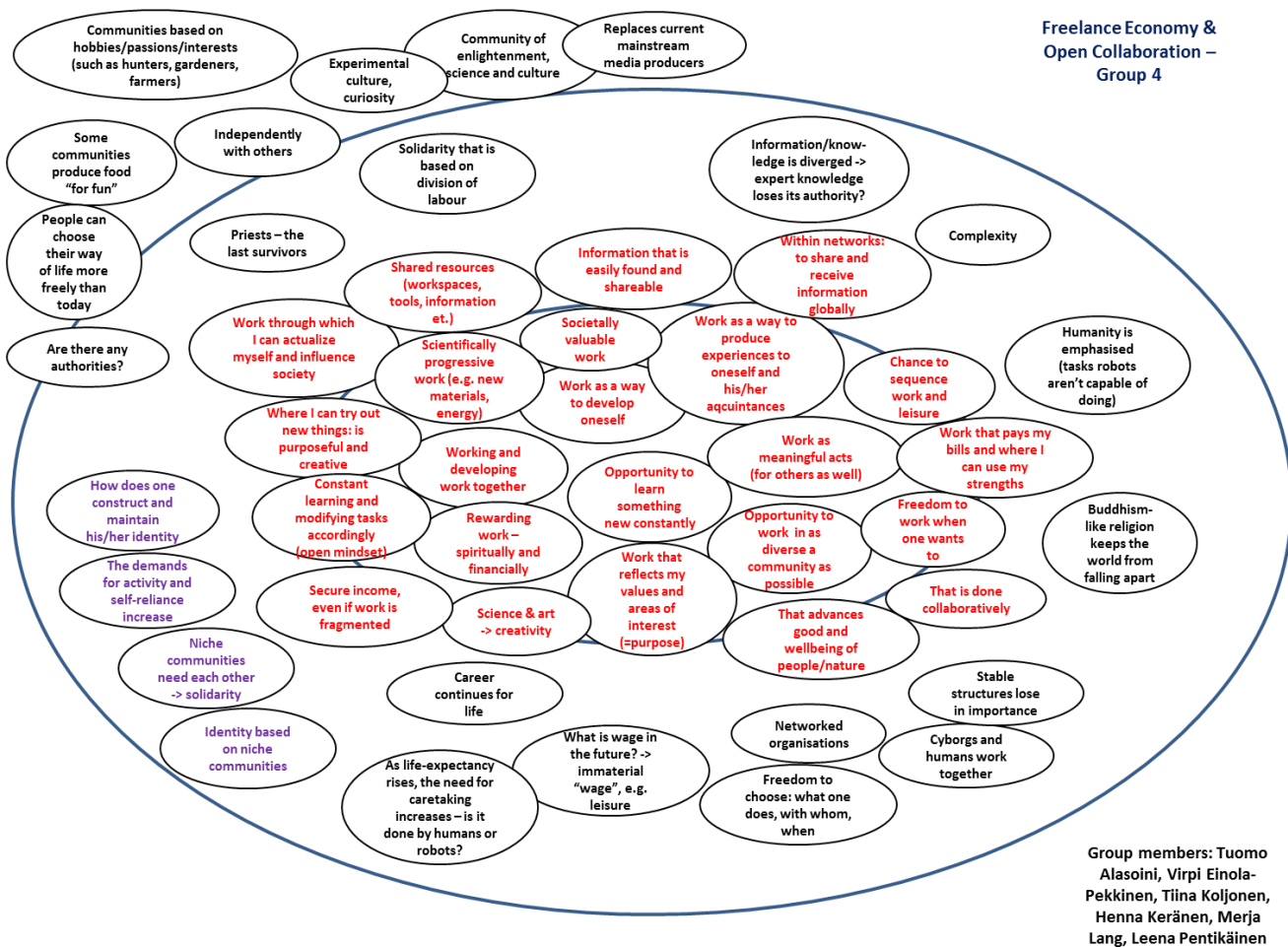
Futures Wheel

Figure 15. Futures Wheel generated by group 4 for Freelance Economy and Open Collaboration.

In the centre of the Futures Wheel the group members produced ideas about their ideal work in a world of freelancing and open collaboration. In the above futures wheel these ideas are written in red font. The group members saw their ideal work a source of experiences, creativity, meaning, purpose, learning and self-development. Work should be collaborative, communal and networked. Work should also provide for the common good. Resources, such as workspaces, information and tools should be shared. One should be able to choose when, where and how to work. It was also seen important that although work is fragmented, secure income would be guaranteed.

After imagining their ideal work, the group started discussing what freelance and collaborative work could be like in 2050. Work would be **open** – one could work when, where, and with whom he or she wants. People could **create their own work so that it reflects their values and interests**. However, this poses great responsibility to individuals to define their work by themselves. To be able to do

so, one has to know his or herself very well. **If a person is not independent and self-reliant enough, he or she might become marginalised.** In such a world, information and knowledge would become highly valuable – those with the most **knowledge and cultural capital** would success better than others. Because work would be global, **competition would intensify. Deep specialisation** would be required in order to fare in competition. However, as everyone would be entitled to basic income and robots would efficiently take care of the production of goods, material well-being would not be the core issue. Work would not be so much about subsistence anymore, but instead about creativity and self-expression. **Material values would have ceded**, and people would not need "junk" to prove their social stance and find their life meaningful. As a consequence, **people would compete increasingly in cultural/social capital and taste. Retirement could also have become a thing of the past**, and people would "work" throughout their whole lifetime.

Perhaps paradoxically, technology would make the world more humane. Although the production would be highly automated, people would augment their abilities with technology, and technology would liberate people to interact and spend time with each other. Technology would be thus used to enhance human abilities and characteristics – such as social intelligence and creativity – not to replace them. Technology would be ubiquitous: it would be integrated into environment, as unobtrusive and often unnoticeable. Technology would also be smart so that it can learn "by-doing", learn to know its human users or "companions", and even reprogram itself. People would also be able to communicate with technology fluently. Our relationship with technology would thus be transformed compared to present.

In this kind of world, identity and meaning would become perhaps even the most important questions: how to create and maintain a meaningful identity, if their traditional sources – such as profession – would cease to exist? People would probably build their lives around communities based on shared values, interests and tastes. Different communities would be aplenty, and culture would become much more diverse than today, not uniform as a global "shared consciousness" would suggest. As these kind of communities would be highly specialised, different communities would need each other - solidarity would be based on sharing products, ideas and resources between these niche-communities. Also, as people would belong to many different communities, their identities would be flexible compared to today, and this would "smoothen" frictions between communities. Different cultural "hybrids", for instance cultures combining Western and Eastern values, could emerge. Some kind of buddhism-like world religion could also provide some shared values and views which would glue the diverse world together. Still, there would probably be communities which build their culture and values in stark opposition to other communities, and they could use extreme means to reassert their identities – such as acts of "information terrorism", including e.g. programming hostile artificial intelligences. On the outermost circle of the futures wheel, the group gathered more concrete ideas about the kind of work they visioned. Reflecting the networked and versatile nature of this future, the group saw it as

complex, not chaotic. "Organisations" would be organic, porous and constantly evolving. **The most crucial skill would be to "find one's thing". Freedom would not be about freedom to consume, but freedom to define one's way of life, with the help from others in their communities.**

Throughout the session, the group discussed the nature of knowledge in such a highly fragmented, diverse and pluralistic world – would each community have their own truths? To resist this kind of development, the group saw that sciences and rational thinking would be of crucial importance. Thus they came up with the idea of a "new enlightenment", a community of sciences, arts, curiosity and experiments, akin to the free-thinkers of the Ancient Greece. These enlightenment communities would also replace today's mainstream media as providers of tested, critical knowledge and rational discussion (that is, discussion based on the principle "best argument wins").

Figure 16. Group 4 constructing Futures Wheel for Freelance Economy and Open Collaboration.
(Photo: Sirkka Heinonen)

Futures Image: Post-Sisu Society 2050

In the futures image session, the group applied their ideas into Finnish context, and visioned a future called "Post-Sisu Society". *Sisu* is a Finnish word for willpower, guts and determination regardless of costs. Alas, culture soaked in *sisu* can sometimes be harsh and unforgiving. Thus, in *post-sisu society* the Finnish culture has become more gentle, playful, open-minded, and relaxed. Social relations have become more networked and communal.

With its strong educational heritage and tradition, Finland has spearheaded the global shift towards the era of the "new enlightenment" by becoming a country of science, arts and culture. Traditional *sisu* is mitigated by curiosity and a culture of experiments, and by leisurely thinking instead of the ethos of hard work.

Global competition and division of work requires specialisation. Peers and communities provide services and products to each other; communities' values and ideas are refined as products and services. Finland's niches in this respect are a global problem-solver and provider of different solutions, provider of ecosystem services, healthcare, and social/cultural startups. Finland differentiates itself also through "alternative culture" – Finland offers culturally something distinctive, odd and curious. Finland has certain virtues which have aided in achieving the society described above. As a small population, Finns know and trust each other, and their social relations are close-knit. The Finnish culture is rather informal, and nourishes creativity. Among these traditional virtues, Finland has become more culturally diverse, tolerant, and empathic.

The ACTVODE Table

After writing their futures image, the group summarized its main elements in the following ACTVODE table. The main **actors** in the described future are community facilitators, startup entrepreneurs and priests. Their function is to bring **social cohesion** to society. The **customers and citizens** in the group's future are peers, common citizens, and cultural "extremists", ie. niche customers. These imply that there is no "mass society" anymore, but individuals and their networks instead. The **transformation** process that has taken place is that communities' values and ideas are refined as products and services, and this is done by startup entrepreneurs. Again, this points to a future in which there are no mass markets but products and services stem directly from communities, making them highly authentic and innovative. The prevailing **values** are empathy, informality, meaningfulness, and trust. Citizens care for each other, social capital abounds, and citizens have a deep sense of purpose. **Obstacles** to and in this kind of a future are poverty, social exclusion, polarisation, and anti-elitism. Despite communality and high social capital, a peer information economy of free individuals may easily appear as elitist and demanding. If an individual is not educated enough or does not have the right cognitive skills, he or she may easily become marginalised. The **drivers** towards such a future are creativity, close social relations and micro-level trust. For a developed information and creative economy to work, shared culture has to flourish, and this requires social capital. Because the society is built from the bottom-up, from the life spheres of individual and communities, **energy** is not seen only as a technological and economic issue, but having cultural and social meaning, and seen as a social artefact and having a spiritual dimension as the source of life. Inspired by the endless possibilities of energy, citizens like to create their own energy technologies.

Table 4. The ACTVODE Table by Group 4 for Freelance Economy and Open Collaboration.

ACTVODE	Post-Sisu Society (Freelance Economy & Open Collaboration)			
Actors	Community facilitators	Startup entrepreneurs	Priests / preachers	
Customers/ citizens	Peers	Common citizens	Cultural "extremists" (niche customers)	
Transformation (processes, practices, technologies)	Communities' values and ideas are refined as products and services	Startup entrepreneurs		
Values	Empathy	Informality	Meaningfulness / Trust / social capital	
Obstacles	Anti-elitism	Social exclusion Poverty / inequality Marginalisation Polarisation		
Drivers	Creativity	Close social relations Micro-level trust		
Energy	Energy has cultural and social meaning	Energy as social artifact	Citizens like to create their own energy technologies	"Sun god" – energy has a spiritual dimension

4.7   Group 5 Results for Freelance Economy & Open Collaboration

Futures Wheel

Figure 17. Futures Wheel generated by group 5 for Freelance Economy and Open Collaboration.

In the scenario, everyone would receive a basic income. The group discussed the forms that this could take. Perhaps the money could be collected through the revenue from the work performed by robots; each person might have a robot which would do work and earn a living for both itself and its host? In any case, having a basic income would mean that people could really focus on what they wanted to do, i.e. "work for satisfaction, not for income" and focus on the "important stuff"– without concerns for their sustenance.

Some of the ideas for ideal jobs were more abstract, such as "designing new things that people like me can appreciate", "spending time with issues that I think are important", and "I can concentrate on questions only. AI tells the answers". In contrast, one ideal job description was quite concrete and specific: "ice-cream seller in a park".

The flexibility of work was regarded as an important aspect of the Freelance society; whether it meant that collaborations could be ubiquitous and global, without the hick-ups of current technology, or that the content or scheduling of work would be determined by one's own interests, flexibility was underlined in several suggestions. An example of this was the "mix'n'match" working day described by one of the participants as ideal: being able to work for a few hours each on different topics and in different fields. Collaboration would not necessarily have to mean only human-human interaction, but could also happen between machines, animals, and humans. In general, the work (situations) ideated were specifically connected to the ubiquitousness of AI, robots, and virtual reality, e.g. managing robots as well as the interaction between humans and robots, which was seen as a possible source of conflicts. Jobs in this setting could be anything from robot psychologist to conflict resolver between robots and non-robots. This definition, "non-robot", sparked a discussion on whether the "norm" actors in this scenario already are robots if living organisms are already defined only as opposites to them (cf. vegetarian/non-vegetarian in current Indian culture). Other jobs that were ideated based on the advanced networkedness of the society were related to entertainment (brain-to-brain games & competitions) and to the estimated repercussions of an over-networked life (teacher of "how to stop constant telepathic connection"), since the group believed that human beings, as such, would not have changed physically, mentally, or emotionally by 2050.

This topic already inspired some of the participants to start thinking more broadly about realistically possible jobs in the described scenario – which took us to the second step of the Futures Wheel. Onto the outer circle of the wheel, the participants added further developed ideas about the jobs and working life in the imagined society. Based on the idea of robot HR management and conflict resolution of human-robot conflicts, the topic of quality assessment was raised. How could the work done by robots be evaluated – would it be done by a human or by a "super robot"? Also, the issue of clashes between artificial and natural was discussed more broadly, not just as regards conflicts between humans and robots.

A topic related to this was the role and status of nature – perhaps everything would be so overtly digitalised that "real" things like nature would be held in high esteem. A suggested job/service was a virtual reality nature guide, based on the fact that nature might have to be fenced off in order to protect it. After the ecological crisis, not many untouched natural areas might be left. A brief backcasting comment was also made that this is something that Finland could actually focus on right now – that there actually still is nature and silence. The dilemma is, however, how to keep the silence while offering it as a service e.g. to tourists?

A central theme was also what would happen to all the people who would not be able to keep up with the demands of the highly online, technologised worklife. It was seen that even with the basic income, having a large number of people with nothing to do – and nowhere to "belong" to – is a threat to the stability of the society. Would there be training programs for their support? Or perhaps they

would each get a support robot which would unnoticeably help them in their tasks? It was seen as important that the skills necessary to thrive in this freelancer society would be taught already to children in schools.

Other topics that the group discussed were e.g. the issues regarding language (what languages will robots speak? What will be the global working language? Perhaps there will be an occupation that translates between robots and humans?), legal issues (robot law; if everything is free/possible, then what is a crime? etc.) and education (who would be the teachers and what would they teach, if everyone can learn on their own, and robots also learn by themselves?).

The topic which sparked the most discussion, and was later chosen as the main focus for the futures image, was the repercussions of the (over-)networked society and working life on human beings – as well as the ideas for possible solutions to deal with the situation. At the same time as multitasking skills were seen as becoming increasingly more important, also the skill of "shutting off" was seen as crucial. People who were not able to shut off the brain-to-brain connections, or their virtual projects, would become severely burned out, as the human physiology would not have changed in just a few decades. A solution for this would be to offer services by occupational health professionals who deal exclusively with "info burn-out" issues. Other possible services would be training programs of social and emotional management skills.

Futures Image: Uber-connected, or There are two sides to every brain

In the futures image session, the group came up with descriptions of this society, which is almost too connected. Work in general is based on freelancing, which is quite demanding on the individual (social needs, no support network except for the basic income). Because of this work structure, there is no retirement – unless the basic income is enough to live on – and since there is no labour in the old sense, there are also no labour unions to speak for those in the working life. Society and education is based on life-long learning, peer-to-peer (also inter-generational) education and sharing of knowledge, which means that everyone is a student and everyone a teacher, as well. As robots do all the menial work, people can focus on the things they want to do, which leads to specialisation, in some instances. In order to work on a project, cooperation between colleagues with different skills and knowledge is necessary. Some colleagues may be close by and some on the other side of the world, and so there are also no traditional offices. People have time and means to explore and experiment with various things and issues, so offices are actually more like laboratories. An important value is nature, especially after the massive ecological crisis that humanity and all other living beings endured in the years before. Thus, extensive data is collected on the nature/human/technology balance in order to upkeep the current, somewhat improved situation.

A lot of the communication is online and as brain-to-brain communication, which is quite tasking on the human brain and the repercussions of which dominate the futures image. People must keep

adapting to the constant new technologies and the new social structures evolving through them. To those who cannot keep up, many kinds of support and therapy services are available, to the extent that the number of brain burn-out treatment professionals has boomed. There are two sides to every brain: on the one hand, speed is valued – everything is instant and online – but on the other hand, there are also opportunities to do work more slowly, as the basic income works as a buffer for sustenance. However, the balance between staying connected but not "Uber-connected" is difficult to upkeep. This makes healthy brain cells a valuable commodity.

Specific services and products developed in this society:
- Well-being coaches and therapists (for all the stressed freelancers who do not know when to stop working or disconnect from the brain-to-brain connections etc.)
- Emotion management training, online (same as above)
- Alarms (in many shapes and forms, either internal to the body, or external; designed to let the person know when they are engaging in unhealthy activities, e.g. being online for too long)
- Social training programs for less skilled (for all those people who are not quick, analytical, well-versed with the technology – so that they do not become estranged from society)
- Entertainment services (entertainment is everywhere, and everyone can produce it to sell to everyone else)
- Consultants for human-robot conflicts

Figure 18. Group 4 constructing Futures Wheel for Freelance Economy and Open Collaboration.
(Photo: Marjukka Parkkinen)

ACTVODE Table

The main **actors** in the described future are robots, online service providers, freelancers and ordinary citizens (A). The **customers** are everyone else, the state, the planet, and interest groups as clients (C). Work is **transformed** in many ways. Work contracts may cease to exist and people will neither retire nor receive pension. Peer-to-peer teaching is intergenerational and brain-to-brain communication is possible. (T) **Values** include cooperation, openness, fun, belonging, efficiency of society, adaptation and flexibility, diversity, information sharing, speed, common good and the overall connection to nature and other human beings. National and international conflicts, old structures of work, cultures, state sovereignty and labour unions may become **obstacles** for the visioned future. Also the human values, such as egotism, individualism and the need to feel safe and secure may be an obstacle. (D) **Energy** is everywhere and it is decentralised – everyone produces energy. It is a service that does not need to be cared about. Society is almost carbon-neutral because of solar energy and the energy provision is based on a balance of natural resources. Energy is also produced by human movement, but no more than is needed. (E)

Table 5. The ACTVODE Table by Group 5 for Freelance Economy and Open Collaboration.

ACTVODE	Uber-connected/There are two sides to every brain (Freelance Economy & Open Collaboration)				
Actors	Robots	Robots	online service providers	regular people" = freelancers	people
Customers/ citizens	everyone (else)		the state	the planet	interest groups as clients
Transformation (processes, practices, technologies)	people are free to work – no work contracts?		intergenerational peer-to-peer teaching	no retirement (= no pension)	brain-to-brain communication
Values	nature / connection to nature and to other humans	info sharing, speed	diversity	efficiency of society, common good	flexibility & adaptation, belongingness	cooperation, fun, openness
Obstacles	the "human" mindset (the need to feel safe and secure)	(inter)national conflicts	the old work structures	cultures, state sovereignty	individualism (egotism)	labour unions
Drivers	revolutionary ideas after crisis & conflict	scarcity of resources -> desire to survive	technology becomes cheaper and cheaper	individualism (=instead of unionization?)	through a common //illegible// no nationalism	virtual reality (e.g. you can visit nature without travelling)
Energy	close to carbon-neutral society (solar energy)	energy is a service (you do not need to care about it)	energy is everywhere	the energy provision is based on a balance of natural resources	everyone produces energy (decentralized)	humans' (physical) motion; "create only what you need"

5. CONCLUSIONS

The results of the Futures Clinique point to a "post-work" future of a peer-to-peer society, where work as a separate sphere in society has more or less withered away. Kilpi (2016) and Dufva et al. (2016), for instance, have come to quite similar conclusions. If people self-organise as peers, and if robots and artificial intelligences (AIs) carry out many – or even most of the necessary tasks – work would begin to resemble voluntary and hobby activities. Work would be redefined as "play", as something valuable and meaningful in itself, not as means to achieve subsistence[22]. Workplaces would transform as communities found today outside the economic sector. As a consequence, the economic life would be defined and driven partly by other than economic goals and values – moral, cultural, aesthetic, and social. Work would become more like life in general. The merging of different societal "divides" such as production vs. consumption takes place in a peer society (see Gajewska 2014).

Some present trends support such projections. 85 % of global population have been said to be losing their trust on traditional institutions (such as governments, experts and companies), despite the recovery from the post-2008 recession[23] [24]. Institutions being the binding glue of society, it might be that self-organising peer communities emerge to replace traditional institutions as a basis of order, trust and continuity. At the same time, however, IMF[25], OECD[26] and the World Economic Forum[27] have started to pay attention on the adverse effects of income inequality. Companies are realising that politics other than those directly concerning their business interests also matter, and that they should invest in "the greater good", not just for their own narrow self-interest[28]. In other words, "capitalistic institutions" seem to be shifting their thinking away from "the only purpose of companies is to produce profit for the shareholders" and "markets will take care of problems" modes, and align more closely with the rest of society. If this trend continues, firms could become social and cultural actors besides economic ones, as the results of the Futures Clinique suggest.

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[22] http://www.theatlantic.com/business/archive/2016/06/would-a-world-without-work-be-so-bad/488711/
[23] http://www.edelman.com/insights/intellectual-property/2016-edelman-trust-barometer/executive-summary/
[24] https://www.washingtonpost.com/posteverything/wp/2016/06/16/why-the-post-truth-political-era-might-be-around-for-a-while/
[25] https://www.imf.org/external/pubs/cat/longres.aspx?sk=42986.0
[26] http://www.oecd.org/social/inequality-and-poverty.htm
[27] http://reports.weforum.org/outlook-global-agenda-2015/top-10-trends-of-2015/1-deepening-income-inequality/
[28] http://www.theatlantic.com/magazine/archive/2015/05/the-disintegration-of-the-world/389534/

The combined effect of material abundance brought about by renewable energy systems, new hydrocarbon materials derived from renewable energy, ubiquitous artificial intelligences, and automation may seem to render the question of income equality obsolete. Here, we would have to assume that this new wealth is distributed evenly, for instance that robots are assigned to *all* citizens or that basic income is taken into use, as some groups suggested in the Futures Clinique. However, the ideas of the Futures Clinique suggest that new forms of inequality could prevail, even in a prosperous peer-to-peer society. People might compete on social and cultural capital instead of economic status and peer-to-peer groups would probably be in unequal positions in terms of desirability. Thriving in a creative peer economy would require competences and self-directedness that many would lack. Furthermore, a society that is divided into numerous peer communities, and where people only communicate with the like-minded, could be chaotic[29], as there would not be institutional power centres which ensured predictability, stability and consensus on basic values and goals, as well as collectively accepted notions of truth[30] (see Mele 2013). A future of this kind was already hinted at by the Brexit vote in June 2016. New social conflicts and political divides may also rise between those supporting openness (of borders, cultures, identities etc.) and closedness, as the Economist[31] proposes. Future communities may be divided into networked and open ones, and into those that prefer isolation and stability.

The main object of the foresight part of the Neo-Carbon Energy project is to anticipate possible social and societal transformations that are enabled by the uptake of the neo-carbon energy system. As mentioned above, the results of the Futures Clinique emphasise the role of artificial intelligence, robotisation, abundance, and the emergence of new functions for companies in future societies (these themes are also highlighted in our background research, found in chapter 2). In regard to peer-to-peer, new kinds of institutions and leadership are needed, because a pure bottom-up peer-to-peer society could be disturbingly messy and without shared direction. Such a condition could be described as *hybridity*[32] where different seemingly disparate areas and phenomena, such as global and local, work and leisure, peer-to-peer and hierarchies, and energy and lifestyles merge together.

Decentralisation of power and novel organisational models have already dramatically changed working life. These novel nuances of self-expression imply growing pressures and opportunities for economic actors. There are already forerunner companies who are not merely following, but actually seeking to find competitive advantage out of the principles of creativity, self-fulfilment and joy in work. As employees increasingly expect flexibility and meaningfulness in the broadest sense in their working

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[29] http://www.vox.com/2016/3/14/11211204/sanders-trump-disrupting-politics
[30] http://www.newyorker.com/magazine/2016/03/21/the-internet-of-us-and-the-end-of-facts
[31] http://www.economist.com/news/briefing/21702748-new-divide-rich-countries-not-between-left-and-right-between-open-and
[32] http://www.glocalismjournal.net/Issues/HYBRIDITY/Hybridity.kl

life, companies must adapt to compete for attracting the best minds. For long, the pursuit of meaningfulness in work was exclusive to certain professions and sectors. This is now changing. Over time, this push may challenge even the last traditionally hierarchical organisations or sectors that so far have proven change-resistant and shape the entire corporate ethos.

However, we argue that the biggest bottleneck is currently in the political sphere where policymakers have so far been cautious to propose structural reforms that would further unleash the creative ethos described by the participants[33]. We offer four explanations to constitute a working hypothesis. The first explanation may be the generational divide. Only few of the incumbents are immersed to the worldview of younger generations. Perhaps unintendedly, they may struggle to relate to the sentiments that they already manifest in their lives and therefore are inactive in shaping related policies.[34] A second, more powerful explanation stems from political resistance in the system. While from some of the conclusions presented here, "soft" recommendations can be proposed more easily, these changes are also posing more difficult questions about the labour market structure. There are gatekeepers who are hesitant to allow further change to take place, and may fear that their organisational strategies cannot cope with these changes.[35] A third and perhaps the deepest underlying factor, in countries like Finland, is the relationship between market economy and political ideology. It is not yet clear how exactly welfare states should be reformed for them to maintain their *raison d'être*. If these findings were shaped into policy, this could have an impact in labour policies, and there may be fears that labour's position is undermined in the negotiations.[36] The fourth, and final explanation stems from a disconnect between the policy prescriptions of decision-makers and the major structural shifts that may be transforming working life. Cosmetic changes, for whatever reasons, may not be enough to address these challenges described in our report[37]. Therefore, political actors now face a struggle in findings policy prescriptions that *both* increase flexibility and freedom of choice in the labour market that enable labour to lead meaningful career paths *while* protecting the employees from precarity. Although the renewable energy sector may create some jobs[38], unemployment due to AI and automatization are mainly perceived negatively. It seems that whether we like it or not, there are broader structural changes ahead, and a public debate needs to take place on the strategies how to cope with these changes.

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[33] http://blogs.lse.ac.uk/politicsandpolicy/how-to-make-a-universal-basic-income-a-reality/
[34] http://basicincome.org/news/2016/09/netherlands-basic-income-debated-first-time-parliament/
[35] http://www.counterpunch.org/2017/01/11/why-dont-trade-unions-support-an-unconditional-basic-income-precisely-when-they-should/
[36] Pointedly, the Annual Conference 2017 of the Finnish Political Science Association is titled: "From the Welfare State to Neoliberalism – from Democracy to Post-Democracy?" https://www.ipsa.org/news/event/annual-conference-finnish-political-science-association-%E2%80%9C-welfare-state-neoliberalism-%E2%80%93-d
[37] https://www.ft.com/content/b209a9e0-0b6d-11e5-8937-00144feabdc0
[38] http://www.se4all.org/sites/default/files/IRENA_RE_Jobs_Annual_Review_2016.pdf

This is something where our work in the Neo-Carbon Energy research project will also concentrate in its forthcoming phases. So far in the research project, the possible futures of a peer-to-peer society have been studied by using four socio-cultural scenarios to study transformation. We have also argued that the neo-carbon energy model could provide the material basis for future societies. As a novel argument, we have proposed that if digitalization, AI, robots, and other emerging technologies continue their emergence, then cheap, clean and plentiful electricity from a renewable energy system could be very much *in demand*.

Next in our research, the results and themes on the future of work (depicted in chapter 4.1) will be worked on to elaborate further the social dynamics and the peer-to-peer ethos of a neo-carbon energy world. We will also further scrutinise the role of AI, robotisation, and technology-enabled abundance in the context of a neo-carbon powered peer-to-peer society. Our preliminary findings indicate that such society could be described as a "hybrid" one, as suggested above. Beyond work, we will also look at how these developments are driving a "clean disruption" and how an emerging vision of a renewable energy society is taking shape. This invites decision-makers into looking at these multiple and simultaneous transformations. While it seems that these changes are pushing for entirely novel technological regimes, it is currently less clear what strategies policy-makers should take for allowing citizens to flourish in world powered by renewable energy and supported by these novel technologies. Therefore, in our forthcoming research, we will also look closer at how such emerging changes can be governed to account for the long-term that is complex and difficult to anticipate. Moreover, we will also address the challenge posed by black swans i.e. sudden surprises with dramatic impact on renewable energy futures and society at large. Taken together, this report has provided discussion on how to react, benefit, and adapt to these multiple changes expected to shape our society and its working life in the 21st century.

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APPENDIX 1. PROGRAMME

Neo Carbon Futures Clinique II
THE FUZZY FUTURES OF NEO-CARBON WORK
Wednesday 13 April 2016 at 11.30 AM – 4.30 PM
Sokos Hotel Presidentti, 3. krs (Kallio-sali), Eteläinen Rautatiekatu 4, Helsinki

PROGRAMME

11.30 – 12.00   Coffee and light lunch

12.00 – 12.05   Words of Welcome
         Tiina Kähö, Senior Lead, Sitra

12.05 – 12.30   Futures Provocation
         Sirkka Heinonen, Professor
         Finland Futures Research Centre (FFRC)

12.30 – 12.45   Futures Window
         Visual weak signals as food for thought

SESSION I
12.45 – 14.00 Futures Wheel
         Discussing and elaborating the futures of work

SESSION II
14.00 – 15.15 Futures Image and ACTVODE method
         Reflecting the futures of work to the Finnish context

SESSION III
15.15 – 16.30 Cross Fertilisation
         Groups present their results to others

The group work in the Futures Clinique is divided into following four themes/scenarios, each depicting one possible future of peer-to-peer work.

1. **Startup communities – Radical Startups scenario**

Economy is driven by networks of startup enterprises. Startups are community-like, with very flat hierarchies. They promise their workers opportunities for meaningful self-expression, and often the opportunity to work with like-minded individuals is the main motivation by which people decide where to work. The borders between leisure and work, and between companies and the rest of the society are blurred.

2. **Corporate communities – Value-Driven Techemoths scenario**

The economy is dominated by a few big corporations, who have successfully merged different business sectors, ambitious R&D, as well as functions previously provided by the public sector. These technology giants, or "techemoths", offer resources, facilities, and platforms for self-organising employees, as well as all the basic amenities from housing to leisure to education.

3. **Cottage Industry and DIY communities – DIY Engineers scenario**

Society is organised around thriving local communities. Do-It-Yourself economy and practical mindsets flourish, and engineer-oriented citizens live off their skills and knowhow, spread through mesh networks. Tinkering, smart scarcity, local energy production, self-sufficiency and upcycling of products are trending.

4. **Freelance economy & open collaboration – New Consciousness scenario**

Robots take care of the most of manufacturing. People are freed from work and get to spend their time on leisure activities, which also provide value for the society at large. Society can be described as "fully automated luxury communism", and it is organised as global collaboration and open sharing of resources and information. Human beings share a collective tech-enabled consciousness – through ubiquitous communications, virtual reality, and also rudimentary brain-to-brain communication, and are deeply intertwined with each other and the nature.

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After the Futures Clinique, the participants will receive a report draft that documents the results of the group work for their comments.

The findings of the Futures Clinique will be reflected in the Neo-Carbon Energy research project, a Tekes strategic research opening, and are connected to the Millennium Project Future of Work/Technology 2050 study.

Write in your calendars! Further discussion on the linkages of technological and social transformation will take place in an international symposium "Clean Disruption for Abundant Futures", which will be organised in Kiasma, Helsinki 7–8 June 2016.

APPENDIX 2. PARTICIPANTS

Group 1: Startup Communities
Moderator: Marjukka Parkkinen
Kiiski Kataja, Elina (Sitra)
Kuusi, Osmo (Utu)
Salminen, Elina (Utu)
Salovaara, Janne
Sandelin, Iris (Kuka)
Similä, Lassi (VTT)
Väätäinen, Anne (TEM)

Group 3: Cottage Industry and DIY Communities
Moderator: Leena-Maija Laurén
Eljala, Jokke (Avainlippu)
Honkapuro, Samuli (Lut)
Keränen, Henna (Sitra)
Laaksonen, Petteri (Tuulisaimaa)
Numminen, Sini (Aalto)
Nygren, Nina (Utu)
Tahkokorpi, Markku (Utu)

Group 5: Freelance Economy & Open Collaboration
Moderator: Hazel Salminen
Haverinen, Aleksi (Gasum)
Mackiewicz, Karolina (Utu)
Pentikäinen, Leena (TEM)
Pura, Minna (Segmento)
Ramstad, Elise (Tekes)
Vainikka, Pasi (VTT)
Zavialova, Sofia (Utu)

Group 2: Corporate Communities
Moderator: Joni Karjalainen
Ahola, Jero (Lut)
Fors, Piritta (Utu)
Hanhike, Tiina (TEM)
Ikäheimo, Jussi (VTT)
Liewendahl, Helena (Hanken)
Lindroos, Pekka (TEM)
Lindroos, Risto (Fingrid)

Group 4: Freelance Economy & Open Collaboration
Moderator: Juho Ruotsalainen
Alasoini, Tuomo (Tekes)
Einola-Pekkinen, Virpi (VM)
Järvensivu, Anu (Ttl)
Keränen, Markus (15/30 Research)
Koljonen, Tiina (VTT)
Lang, Merja (Utu)
Vaara, Mari (Kuka)

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