ECOLOGICAL PRODUCTION IN A POST-GROWTH SOCIETY

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This text is a discussion paper of ECOPRO: Ecological Production in a Post-Growth Society by Maya Maes & Dirk Holemans (June 2015)

ECOPRO is a project of Green European Foundation (gef.eu)

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1. INTRODUCTION

Ecological Production in a Post-Growth Society (ECOPRO), the successor of the 2014 GEF-project Socioecological Reindustrialisation (SERIND), explores pathways for a transition towards **ecological production**, as part of a sustainable economy that is low-carbon and fosters an equal society. SERIND was initially launched to form a knowledge alliance of European partners, in order to find ways to reinvigorate European industry, but ended up being a more systematic effort to rethink the economy. In 2015, the successor ECOPRO will look at ecological production in an embedded economy, which reinstates the primacy of society and politics in shaping social-ecological transformations[1]

In our European context, we have to be aware that there are structural differences between different regions and member states: each has its specific ecological challenges and economic development trajectories. Therefore, only a **multitude of context-sensitive solutions** will work. This is why we reapply the fruitful working method of SERIND: exchanging national perspectives to learn from each other in a complex world by fostering the **knowledge alliance** of national Green foundations with their respective national partners in civil society, politics, administration and business. In ECOPRO, ten green organisations from different European countries and regions (Austria, Catalonia, Croatia, Finland, Flanders, Great Britain, Greece, Hungary, Ireland and Luxembourg) are involved.

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1   Karl Polanyi is probably the most important thinker of a social-ecological transformation. His systematic attempt to oppose Hayekian neoliberalism as a dangerous "liberal utopia" has remained the key reference in conceptualising the current "Great Transformation". Cf. https://www.gbw.at/fileadmin/user_upload/gbw_allgemein/6_PDFs/Werkstattschrift08a.pdf

oiKOS DIE GRÜNE BILDUNGS-WERKSTATT GREEN FOUNDATION IRELAND green institute greece HEINRICH BÖLL STIFTUNG GREENHOUSE nous horitzons fundació Ökopolisz alapítvány Gréng Stëftung VISIO education | culture | think tank

Our vision is a production 2.0 that manifests itself in different forms and pathways for development and is guided by the **principle of sufficiency.** The future of production does not simply consists in the transformation of big industrial plants, but also resides in the emergence of more decentralized networks of so-called micro-factories as well as non-monetary forms of economic activities – from urban gardening and commons to the care economy; new citizen cooperatives already experiment with new modes of ecological production. The pathway of modernising the existing industrial base has to involve an increasing importance of a circular and sharing (repair) economy.

This discussion paper attempts to stimulate a structured discussion through exploring **different pathways for development**, which can contribute to a profound social-ecological production. While these paths are constantly developing, we consider them as potential inspiration for the creation of other paths, which ultimately will form a toolbox for a new economy.

The four pathways explored in this paper are:

– Production 2.0: peer-to-peer production;
– Conversion of existing companies so as to contribute to a more regionalised circular economy;
– Product-service systems;
– Potential of sharing and commoning.

With this project, we aim to structurally nourish the discussion on a **post-growth society**, to view the future of production and consumption against the backdrop of sustainability and fairness. The concept of sufficiency therefore has to play an important role.

2. THEORETICAL FRAMEWORK

2.1 Beyond growth and towards the "good life for all"

The GDP-growth focused economy, which has been very successful in the 20th century, does not deliver its promises anymore: growing inequality and structural unemployment in the EU go hand in hand with the transgression of the planetary boundaries. Growth strategies are, in other words, dysfunctional and no longer an option. Aurélie Marechal identified five big moves to go beyond growth in the *Green European Journal of 2012*[2]: we need to share wealth, share work, reorient financial profits towards investments in the real economy, reduce the overall scale of production and consumption, and experiment with local alternatives. Looking at such alterna-

tives is part of the big move to go beyond growth. However, these initiatives are not enough if they merely re-establish traditional economic power relations. In line with the key concern of the Viennese congress on "Good Life for all"[3], we need to look for the material, mental and social infrastructure and the respective institutions to transform niche alternatives into "normal" socio-cultural norms and economic activities. It is important for the green ideology to strive for a more fair and just society, where the economy is embedded in society and always measured against the backdrop of sustainability and fairness[4].

Such a post-growth society does only exist in an incipient way. Many niches already exist, which are ready to become normal societal and economic practices. A multi-level perspective offers the link between the utopian perspective of the good life for all and existing social innovations, which can guide the transition from one economic model to another.

2.2 Multilevel perspective

In order to create a solid transition to a more sustainable economy, society has to explore different transition paths and develop possible synergies. A transition is not a linear, chronological evolution, but a **social learning process**, involving letting go of old opinions and certainties to shape new alternatives. One possible frame to articulate this process is offered by Transition Management, an approach which tries to shape this process and provides guidelines through a multilevel perspective[5]. The multilevel concept rests on the understanding that societal systems have three layers: 1) the landscape with global trends such as climate change; 2) the dominant structure, culture and practices or regime; and 3) the niches on a microlevel. The niches react to problems in the regime and involve solutions driven by users, whereas changes in the landscape can force change on the regime[6].
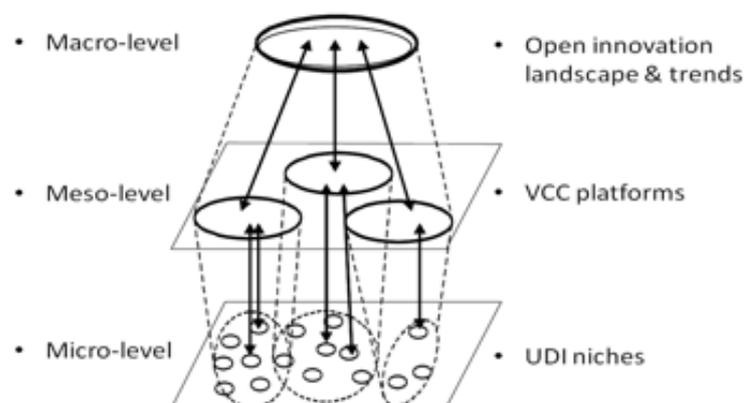
Multi-level perspective on transitions (Tanev et al., 2011)

5   Paredis, Erik, ‚Pleidooi voor een genuanceerde kijk op transitie', Oikos Tijdschrift 68, 1/2014, pp. 71-86
6   Tanev, S., Knudsen, M. P., Bisgaard, T., Thomsen, M. S., ‚Innovation Policy Development and the Emergence of New Innovation Paradigms', Technology Innovation Management Review, November 2011, http://timreview. ca/article/496

2   Marechal, Aurélie, ‚No growth?', Beyond growth/degrowth, Green European Journal, 03/09/12, pp. 47-55

The image below shows an evolution of transitions from a dynamic and multilevel perspective, with an emphasis on technology[7].
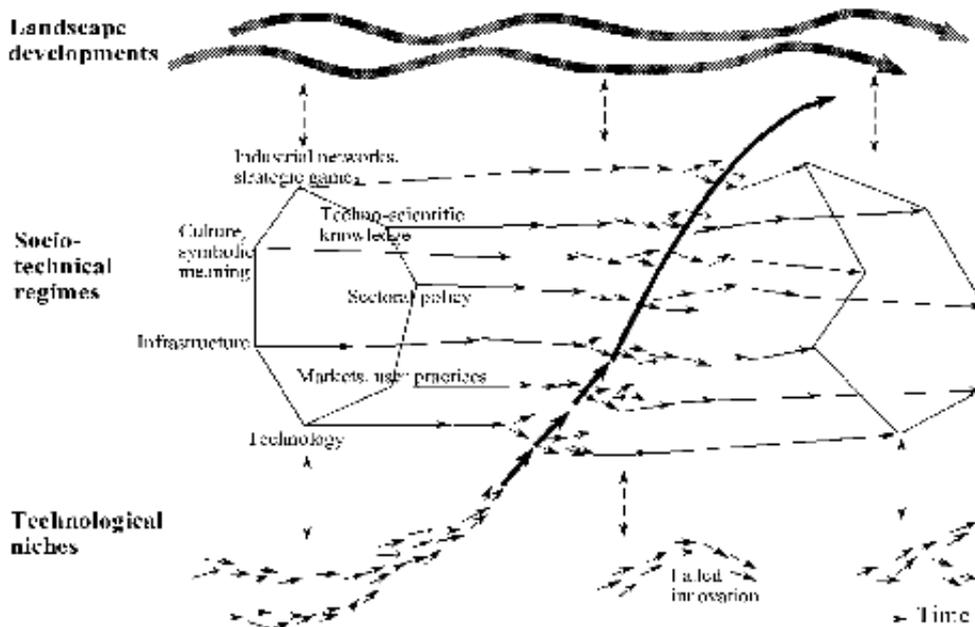
A dynamic multi-level perspective on technological transitions (Geels, 2002, p. 1263)

Transition processes are complex, span a long period and involve many actors with opposing visions that sometimes cut the grain of traditional policy areas. Transitions are unpredictable processes and managing them requires flexible and creative approaches. This makes centralist steering impossible: "everyone steers, no one decides." [8] Even if we have a broad schematic understanding of what needs to be done, we must be wary of demanding the implementation of a pre-established agenda that has been decided upon by experts and technocrats.

Every level requires a different form of steering. In an early stage, experiments occur in niches, which can create friction but nonetheless provide the conditions for transitions. Afterwards, a new perspective or discourse (culture) and a set of innovative practices emerge, which are shared and spread over an increasingly larger scale. New infrastructures, such as decentralised energy providers or pedestrian zones, and new institutions, such as public support structures for the commons and sharing, can turn these niches into sustainable systems. Furthermore, it will be necessary to deconstruct existing energy and mobility infrastructures, as well as mentalities of consumerism and egocentric individualism. This will

necessarily imply conflicts and has to be implemented with the support of regulations, norms and laws, as well as fiscal and technical support. In this way, the regime can be steered to give niches more chances and to make smart use of landscape trends.

Managing the overall transition ultimately means: **creating a common discourse (direction) and a common strategy (agenda) that contextualise experiments (practices)**. This process is envisaged to enable learning from them across boundaries and domains, and to steer systematically towards structural change. Transformations are normative processes that imply changing structures of privilege and power, thus, social conflicts will be an inevitable part of them. Policy choices are never neutral, as transformative change in production processes rest on ethical perspectives and can, therefore, only be realised through collective societal choices. The transition towards sustainability is immanently political, and **policy conflicts** will be an inevitable part of transition management. Even in new political arenas, where answers on societal and ecological issues are sought for, strategic decision making to push one's own agenda and other collective action problems are feasible.

Both SERIND and ECOPRO were grappling with a forked pathway:

On the one hand, there is the pathway that attempts to modernise our industrial base, aiming at innovation,

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7   Geels, F. W., ,Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study', Research Policy, 31, 2002, pp. 1257-1274, 2002, http://www.eawag.ch/forschung/cirus/lehre/fruehere_veranstaltungen/hs08/downloads_ewv/4_5_6_Geels_2002.pdf
8   Loorbach, Derk, Jhagroe, Shivant, Roorda, Chris, ,Transitiekritiek en kritische duurzaamheidstransities', Oikos Tijdschrift 67, 4/2013, pp. 63-72.

efficiency and sustainable technology to make our industry more competitive in a globalised economy. On the other hand, there is the road that leads to stronger local economies based on citizen cooperatives and regional linkages, linking the question of sufficiency with the vision of a more equal society. The first road has to provide an answer to the increasing concentration of economic power and the emergence of innovative local initiatives; the second road has to provide an answer to the challenges for the European industrial base under increasingly international competition. Alone, both strategies have their shortcomings; together the can provide a feasible approach.[9]

A new understanding of efficiency as the means for a sufficient lifestyle instead of the means for economic growth is needed.

2.3 Politics of sufficiency

How many things do we need in order to have a good life? Research has shown that, after a certain threshold, a further growth of income no longer increases happiness.[10] It is the paradox of our time: by believing that more goods will increase our happiness, we suffer from our drive to work and consume more. We all value our freedom greatly, but we suffer from it because it has become an obligation to achieve, to make it. Anyone who does not pass this bar, is called a loser.[11] The idea of ‚enough' is crucial in ecologism, because ‚more' does not always mean ‚better'. The function of the economy should be then to provide enough for everyone, forever. *"Economies should seek to universalize a material standard of living that is sufficient for a good life but which is sustainable into the deep future."[12]* Once basic needs are met, people can focus on other things than increasing material living standards, such as exploring peaceful, creative activity.

The goal of politics of sufficiency is ultimately to make it easier to practice sustainable lifestyles. In our liberal democracy, we agree that when one person's freedom would restrict the freedom of others, politics should step in. But when a lifestyle is based on sufficiency, it follows that it is minimally invasive upon others in realizing their own choices in life. For this

reason, it needs to be encouraged by politics.[13] People with this lifestyle are fully aware of the challenges we are putting the globe through, and are trying to mitigate their negative impact by making conscious consumerist choices, by attributing to social innovation and new forms of technology and by learning from international examples such as Bhutan's Gross National Happiness Index, the cycling culture of Copenhagen, India's vegetarian culture and so on.

What a lifestyle of sufficiency and its politics is, is explained in the book "Politics of Sufficiency" by Uwe Schneidewind and Angelika Zahrnt. Surely, in order for politics of sufficiency create the conditions for citizens to practice this lifestyle, it should allow them to participate in the policy-making process on multiple governing levels. Broader discussions about the politics of sufficiency are currently held.

In what follows, we will explore four new developments in society and economy, which can contribute to a profound social-ecological production. None of these developments are a panacea promise to solve all the challenges. It is up to each city, region and country to explore the context-related benefits, opportunities and try to avoid dangers and potential drawbacks. As an earlier Oikos-GEF project showed, cities are increasingly important, as the world rapidly continues to urbanise. Cities can even lead the transition by focusing on the creation of a closed circular economy and a slow economy[14].

3. FOUR PATHWAYS TO ECOLOGICAL PRODUCTION

3.1 Peer-to-peer production and Commons

In order to stimulate more ecological forms of production, the model and principles of peer-to-peer production (P2P) (such as transparency, ownership and added value) can provide orientation. Take *Wikipedia* as a famous example: many people contribute to create an on-line encyclopaedia, without a classical hierarchical model[15]. *Peer production* or mass collaboration is a way of producing goods and services, which relies on self-organizing communities of individuals, where labour is oriented and coordinated towards a shared outcome.

As example of this, we have the domain of ICT, free and open-source software, such as Linux, and open- source hardware, such as micro controller board Arduino. All are the results of peer production. *Common-based peer production* or social production is a subset of peer production. It means that resources are shared among individuals who cooperate with

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9   See http://www.dirkholemans.be/drupal/?q=node/64
10 According to the 2010 research of famed psychologist Daniel Kahneman and Angus Deaton, the bar is set at an annual income of 75 000 dollar for subjective well-being, life evaluation or satisfaction does continue to increase. http://www.pnas.org/content/107/38/16489.full; Tim Jackson on the other hand, in his book Prosperity without Growth shows that an average income of 15.000$ per capita is sufficient to have a good life (like e.g. in Costa Rica), and that people living in much richer countries do not live longer, feel more happy, etc.
11 http://www.theguardian.com/commentisfree/2014/sep/29/neoliberalism-economic-system-ethics-personality-psychopathicsthic
12 http://simplicityinstitute.org/wp-content/uploads/2011/04/TheSufficiencyEconomy3.pdf

13 Politics of sufficiency, https://co-munity.net/system/files/Schn.pdf
14 Holemans, D., ‚Cities as eco-factories of the future', Green European Journal, 6, 26/10/13, http://www.greeneuropeanjournal.eu/cities-eco-factories-future/
15 http://www.openstructures.net/pages/2#vraag-1a

each other, and that more commons can be created in the process. Commons are common property of the community.

Wikipedia as an example of P2P production

3.1.1 Transparency

Transparency is an important trait in P2P production. Technological innovation can be enhanced when many are invited to contribute to and enjoy the fruits of a common goal. Thus is the case with Linux, an open software operating system, where the process of programming and aggregating information is shared. After 20 years, Linux powers tens of millions of Android mobile phones, consumer devices and more.[16] Transparency signifies that the product is commonly designed on the basis of free exchange of information within the community. In such a collaborative infrastructure, the code is openly available for the community, the production process is discussed openly, and the goals and release cycle of a product are available on a community website. Outsiders could have access to community planning and strategic decision making during the production process. Moreover, designers receive updates on what is accomplished and what still needs work.[17] The mode of production is modular: objectives are divisible into components or modules. Each module can be created independently. This allows individuals with different skills to work together at various places and times. Furthermore, these modules can differ in size: the more granular a resource, the smaller the chunk of information it contains. Afterwards, it should be easy to merge the individual efforts into one product. The Internet is a crucial facilitator for this.

In other words, in a peer group, everyone can be aware of what others are doing (horizontal knowledge) and what the aims of the projects are (vertical knowledge).[18] Everyone can contribute freely according to his or her abilities and vision. While this system is not based on a classical hierarchy, it

possibly allows for a meritocratic hierarchy, as quality checks can be executed by a college of experts.

The opportunities and advantages of this mode of production are multiple. The design process can go faster, designers gain information of all levels, and can identify the tasks they want to perform. There is a reduction in marginal costs such as traffic, while overall efficiency increases.

Currently, contributors oftentimes do not receive financial compensation. Most of them have an intrinsic motivation, sometimes multiple, to take up a role in a project. For instance, when a consumer is unhappy with the quality of a certain product, he/she can decide to improve it and become a producer. He/she can then share the wealth created by collective intervention. Intrinsic motivation can enhance the success rate of a project. This does not have to be a matter of *"let's all sing kumbaya around the campfire and make the world a better place"*, as Linus Torvalds, creator of Linux, puts it.

> *The real idea of open source is for it to allow everybody to be ‚selfish‘, not about trying to get everybody to contribute to some common good. [...] Those selfish reasons by no means need to be about ‚financial reward‘, though. The early ‚selfish‘ reasons to do Linux tended to be centered about just the pleasure of tinkering. Programming was my hobby, and learning how to control the hardware was my own selfish goal. And it turned out that I was not all that alone in that.[19]*

Nevertheless, there are several possible drawbacks with this type of production that can threaten the openness and dynamism of these organizational systems. Typical community problems are possible: alienation, egotism, and the emergence of a tribe mentality. It is possible that contributors will exhibit freeloader behaviour if there is too much red tape in the production process (e.g. neglect to fill in logs, or document the work they did). It can happen that second or third order benefits of sharing, giving or helping in the community are not understood. Disorientation and illegibility of the dynamic network structure, information overload and a loss of focus or coordination are possible. Insuring a steady flow of input can also be difficult, as the turnover of contributors is often high.[20]

A possible solution to these problems is the idea of an *oasis*. Oftentimes, peer production workers are individuals who are mostly nomadic. They do not stay in one place to develop software, but hop from one place to another. These places generally need physical space, equipment and tools, a virtual platform, a pool of competencies, a cluster of interests, an

16   http://www.linuxfoundation.org/about
17   It is a so-called stygmeric system. See Bauwens M., De Wereld Redden. Met peer-to-peer naar een postkapitalistische samenleving. Uitgeverij Houtekiet & Denktank Oikos, 2013.
18   This system is called holoptism, as opposed to panoptism.
19   http://www.bbc.com/news/technology-18419231
20   Brastavicenau, T., „Problems in peer production", Sensorica Blog, 10/02/2015 http://sensoricablog.blogspot.ca/

assemble of knowledge commons, a concentration of specific know-how, and so on. This nomad city or oasis has keepers or custodians who are faithful to one location and maintain, accommodate, guide, facilitate and coordinate the oasis.

3.1.2 Value creation

One of the virtues of a common-based P2P production process is that the created product provides a direct utility for the entire community. The ultimate goal in true common-based P2P production is not necessarily to make a profit (although it is possible), but to make a product that does not harm society, that has a positive impact on a social and environmental level. Trust, welfare, health and autonomy are important factors that need to be taken into account. In contrast to the traditional production and consumer model, the external costs are internalised in the production process. For instance, products are no longer designed with planned obsolescence, because the fast product cycle does more harm than good to society. This is why Michel Bauwens states that in common-based P2P production the individual interest and the community interest are one and the same (Bauwens et al., 2008).

3.1.3 Ownership

As common property, the use of the products is free in a common-based peer production. This goes against the idea of patenting new products, which – contrary to the general belief – can actually hinder innovation[21]. For instance, The Economist writes that patents in biotechnology, genetics and other disciplines have discouraged the combining and re-combining of inventions to yield new products and processes. Also the pursuing of patents for cross-licensing agreements, increasing litigation and thereby the transaction costs, might hinder actual innovation. For this reason, car manufacturer Tesla recently decided to give away their older patents.[22] Currently there is a tension in the view on ownership between the P2P concept as developed by people such as Michel Bauwens, and proponents of the older concept of the Commons as researched by Tine De Moor and others. While the P2P thinkers insist on maximal free access (such as is the case of Wikipedia, where everyone can contribute freely), Commons are defined by the latter as ‚institutions of collective action‘ based on a collective common, a well-defined community of commoners and a clear set of rules.

In order to solve this tension, distinguishing betwee n in-group and out-group might have some value. There have been experiments on a peer production license, that is a license based on reciprocity and commons, with which private actors were asked to make a contribution, and other commoners, cooperatives and non-profits were allowed to use the product freely for non-commercial purposes. Guerrilla Translation in Spain uses this type of "Licencia de Produc-cion de Pares", this initiative is quite successful, has a large community and a political goal: to translate texts that would otherwise not get attention in the collaborative economy community because they were not in English. Only aforementioned groups with reference to the license conditions of their work can commercially exploit their work.[23]

3.2 Open design and micro-factories

When envisioning a new way of production, Italian design strategist Ezio Manzini[24] starts from the assumption that *diversity* and *complexity* – the basis of the resilience of natural systems – are key traits for artificial systems as well. He envisions these systems to be small, local, open and connected. Ideally, they would represent a synthesis of information systems and energy systems with lean production modes. Concretely, this means that products need to be designed in such a way that they can be produced in the neighbourhood of where they will be used, they need to be made by local resources and the distance between producers and users' needs to decrease. In this view, a combination of traditional technology, crafts and high technology can make this possible. He also believes that technological innovations are inextricably tied to social ones. Moreover, he holds that each individual has a role to play in designing a changing world, either as an expert or in a more diffuse way.

Because production would be decentralised in local microfactories, mass customisation (economies of scope) is possible. This allows for quick responses to a changing environment and altering requirements. Production is distributed in local factories, which makes mass customisation (economies of scope) possible. Low-cost tools and open designs can make the technology available at a large scale and can get products to market faster while using less capital to find a winning concept.[25] Microfactories are a great counterpoint to classical production, because they employ an economy of scope by taking advantage of low cost tooling and co-creation, resulting in the ability to get products on the market

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21 https://www.eff.org/patent, http://www.economist.com/node/15479680
22 "Technology leadership is not defined by patents, which history has repeatedly shown to be small protection indeed against a determined competitor, but rather by the ability of a company to attract and motivate the world's most talented engineers. We believe that applying the open source philosophy to our patents will strengthen rather than diminish Tesla's position in this regard." http://www.teslamotors.com/blog/all-our-patent-are-belong-you, http://truthonthemarket.com/2014/08/13/teslass-new-patent-policy-long-live-the-patent-system/

23 http://www.guerrillatranslation.es//, http://endefensadelsl.org/ppl_deed_es.html
24 Brooks, S., "Design for social innovation", Shareable, 26/07/2011,http://www.shareable.net/blog/design-for-social-innovation-an-interview-with-ezio-manzini
25 Gas2, "Local Motors opening two new micro-factories for 3D printed car", 13/01/2015, http://gas2.org/2015/01/13/local-motors-opening-two-new-micro-factories-for-3d-printed-car/

faster while using less capital to find a winning concept.[26]
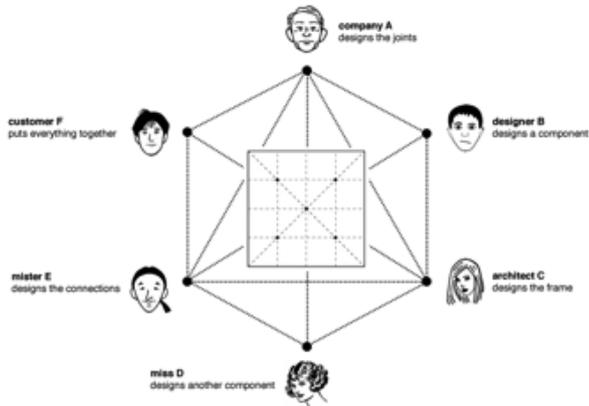
Open modular system for hardware - OpenStructures project

There are many examples of open design. Wikipedia provides an excellent example of an open P2P encyclopaedia where knowledge is shared; Linux is an example of an open source operating system, where the process of programming and aggregating information is shared. We may also find a number of examples of this in the realm of hardware. Open modular systems, such as Grid Beam, Bit Beam, Open Beam, Maker Beam, Contraptor and the Brussels OpenStructures[27], invite anyone to design and produce parts and components according to one shared modular grid. Standardisation in design makes all the building blocks compatible, just like LEGO blocks, allowing for a great variety of objects to be constructed. OpenStructures started in 2007 and is still in an experimental phase, but has already yielded objects from household devices to cargo bicycles, suitcases and furniture.[28] Bolts and screws link the parts, making it easy to assemble and disassemble. With OpenStructures, the possibilities of products in the hands of different designers is almost limitless. It is supported by an on-line user database, which facilitates the re-use of parts by providing a log of all objects and components ever made (showing their parts and what objects they can be used for) on the OS grid. Furthermore, all elements display the dimensions, materials, designer's name, license, order information and a serial number.

Not everyone needs to design or build his own products, however. Firstly, after downloading the digital design, a consumer can assemble the product with bought, re-used, 3d-printed of laser-cut parts.[29] Secondly, a company can buy the license of a design, and convert it into a building kit. Consumers would then assemble the product, without having to search for the parts themselves. Thirdly, the manufacturer can place the object on the market as a finished, assembled product. These three ways of putting the design out there, provide for several ways of marketing open modular construction.[30]

Open modular construction has the same design process as Linux. However, the component parts do have material costs. This creates challenges for implementing the P2P production process, but it also creates an opportunity to make profits from the coordination and distribution of the materials. To reduce shipping costs and make them available worldwide, the parts need to be produced by as many manufacturers as possible. The ambition of Thomas Lommée, creator of OpenStructures, is to have little shops, in which everybody can participate in a collaborative economy and where small, self-employed producers have their place. He also envisions a warehouse where modular parts can be stored, bought and re-used.

The advantages of such a system are multiple: it would foster rapid innovation without the drawback of wasting energy and materials. Furthermore, it would encourage the re-use of physical parts (which provides a sustainable alternative to glued consumer items that cannot be readily reused). Finally, there is no need for expensive tools or special skills — mistakes can be easily corrected by merely unscrewing the modular parts from one another and repositioning them.

The three criteria —transparency, value creation and ownership —allow the see clearly the difference between common-based peer-to-peer initiatives and hyper capitalist ones like Facebook and Uber. Compared with e.g. Linux, they are not transparent (instead of open source they us secret algorithms), they capture the created (commercial) value by users, and are in the hands of a small groups of venture capitalists and financial groups such as Goldman Sachs.[31]

26   Gas2, "Local Motors opening two new micro-factories for 3D printed car", 13/01/2015, http://gas2.org/2015/01/13/local-motors-opening-two-new-micro-factories-for-3d-printed-car/

27   http://www.openstructures.net/pages/2#vraag-1e

28   Low-tech Magazine, "How to make everything ourselves", 12/2012, http://www.lowtechmagazine.com/2012/12/how-to-make-everything-ourselves-open-modular-hardware.html

29   Low-tech Magazine, "How sustainable is digital fabrication", 03/2014, http://www.lowtechmagazine.com/2014/03/how-sustainable-is-digital-fabrication.html

30   "A manufacturer can choose to produce a part in which he sees economic potential. Another manufacturer can choose to sell a building kit or a finished product of a design they think will sell. A designer can make money by uploading a design that might be free to download for personal use, but not for commercial use. A manufacturer that wants to commercialize this design, can then buy the license from the designer. Craftsmen can focus on the design of exclusive, handmade parts in special materials, which are compatible with popular mass produced items. Others can start a fab lab or tech shop where people can build their own modular objects for a monthly fee." http://www.lowtechmagazine.com/2012/12/how-to-make-everything-ourselves-open-modular-hardware.html

31   Holemans, D. "Sharing is not always Sharing, Green European Journal, April 16 2015, http://www.greeneuropeanjournal.eu/sharing-is-not-always-sharing/

3.3 Conversion into circular and more regionalized economy

The circular economy is a generic term for an economy that is regenerative by design. Growth and profit are no longer the guiding principles. Biological materials are designed to re-enter the biosphere, and technical materials are designed to circulate with minimal loss of quality; that is, they are designed to be re-used, refurbished, and in the end recycled. This means that the outputs of one productive process can become the inputs of another.

In Antwerp, Belgium, the company Umicore has reinvented itself from a century-old mining company into the world leader in the field of recycling metals from cell phones and batteries from electric cars and transforming them into high-tech materials. They are capable of recycling twenty different metals. Closing the materials loop is an important part of their business strategy because it offers them a competitive advantage, it offers their customers a vital service and it has direct environmental benefits. Making their production process circular means that they attempt to increase the performance of every step in the value chain, from collecting and dismantling to pre-processing and materials recovery.

The circular economy has received quite some attention recently: the European Commission (EC) adopted a communication on the circular economy called "Towards a circular economy: a zero waste program for Europe". It focused on zero waste for Europe and wants to establish a common and coherent EU framework to promote the circular economy. However, this package has been on hold since the end of 2014 under the Juncker Commission, waiting for a new proposal of the EC somewhere in 2015.[32] Critics fear the proposal will hardly be more progressive, as the newly elected Commission's focus will be on job creation for a slow economy and deregulation[33]. National authorities and international organisations are nevertheless on the move.[34]

Besides recycling, increasing resource efficiency is also focus for the circular economy. The Copenhagen Resource Institute is currently developing a resource efficiency self-assessment tool for SMEs, together with an international consortium led by Technopolis Group, for the European Commission's Executive Agency for Small and Medium-sized Enterprises (EASME). This tool will support SMEs in "assessing their resource efficiency performance against a variety of parameters, provide information on appropriate resource efficiency measures and their cost while, at the same time, collect and supply related data and statistics at European level".[35]

Danish Fashion Institute

Contributing to sustainability can be difficult for SMEs particularly in the global fashion and textile sectors, which are some of the most polluting ones. After the disaster in Rana Plaza, textile factories are increasingly focusing on a more ethical production process. However, they need guidance in improving their knowledge on concepts such as the circular economy and sustainable business concepts. For SMEs, the process needs to be simple and in collaboration with managers and designers, while maintaining competitiveness in the long run. "How to be nice" is a tool that helps companies to deal with the current social and environmental challenges that the global fashion industry is facing. It is created by the Danish Fashion Institute, the United Nations (UN Global Compact 10 principles) and the international fashion industry and is part of the Nordic Initiative, Clean and Ethical (NICE). The tool addresses questions regarding the impact of the design process on the environment and climate (they believe that designers can control up to 80 percent of the environmental impact) and chemical use[36]. It believes that there is no one-size-fits-all solution for SMEs and therefore encourages companies to look at the issue from their own perspective. Looking at the tiers of suppliers and subcontractors is key, therefore a company can set up an own code of conduct and a set of responsibilities which takes into account the company's particular situation. In short, SMEs are provided with a learning tool as a first step towards sustainability.[37]

3.4 Product-service systems

Instead of focusing on increasing the number in sales, providing services that are linked to the product could become a key goal for producers and an attractive alternative for citizens that strive for more sustainable lifestyles. This approach

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32 Csiscai, M., "Environment committee blasts commission over circular economy", The Parliament Magazine, 22/01/2015, https://www.theparliamentmagazine.eu/articles/eu-monitoring/environment-committee-blasts-commission-over-circular-economy

33 Buurman, R., "Commissie blundert bij terugtrekking pakket kringloopeconomie", BBLV, 06/02/15, http://www.bondbeterleefmilieu.be/page.php/30/836/15553

34 For instance, l'Institut de l'économie circulaire reports on 17/2/15 that France wrote the definition of the circular economy in its Code de l'Environnement (art L. 110-1-1). ACR+ is developing a specific working group on circular economy planning by cities and regions. It aims to develop sectoral guidelines, including performance indicators, as a framework for improved planning and practical implementation. It will also promote and facilitate the exchange of best practices and their duplicability, as well as develop new initiatives and new business models. Colas, G., "Initiative launched to help local and regional authorities adopt resource efficiency through a circular economy", 2degreesnetwork, 7/10/2014, https://www.2degreesnetwork.com/groups/2degrees-community/resources/initiative-launched-help-local-and-regional-authorities-adopt-resource-efficiency-through-circular-economy/

35 http://www.cri.dk/projects/development-of-resource-efficiency-self-assessment-tool-smes CRI will also make the circular economy-thiking mainstream in the Nordic countries, by highlighting succesfull business models. A stakeholder workshop will be held in April 2015 to finalize and compilte the Nordic case studies. http://www.cri.dk/projects/moving-towards-a-circular-economy-successful-nordic-business-models

36 Nordic Fashion Association, Learn how to be nice, http://www.nordicfashionassociation.com/content/learn-how-be-nice

37 Nordic Fashion Association, Environment, http://nordicfashionassociation.com/content/environment

is defined as 'product-service systems'. Think for instance of a company not selling cars anymore, but offering mobility services. So the central value is not placed on the exchange of the products that are consumed (and the more products are sold, the higher the profit), but on the value of utilisation (so the profits are dependent on customer satisfaction).

Product-service systems fit very well in the transition from a throw-away economy to a circular economy. First of all, because the company stays the owner of the product (and thus resources) it offers for utilisation. Second, the company will benefit from the fact that products last longer and do not break down. Third, the company has good reasons to invest in repair services. Overall, the producer and service provider will bear a greater responsibility for the product's full life cycle. This can also lead to the creation of new jobs. Product-service systems in a circular economy will be more labour-intensive than an economy based on mass production (in the East) and throw-away consumer routines. Think about jobs created because of labour-intensive services such as take back systems, repair services and networks, refurbishment or disassembly processes.[38]

Product-service systems thereby reduce the amount of used resources and change the way end-consumers use the product.

One example of a company who has managed this is Xerox[39]: in its managed print service PagePack, it asks a certain price for a copy instead of asking users to buy their product in order to offer customers a complete service. Maintenance costs of the copier are calculated in the price of the service. This is an example of a product-service system, which aims to provide sustainability of both consumption and production.[40]

3.5 The potential of sharing and commoning

Among a particularly progressive and thoughtful cross-section of the population, the broad movement for the commons, as well as sharing knowledge, products and space with others, is becoming everyday practice. Doing things together is not only a different form of economic activity; it also fosters community building and social cohesion. Why purchase a drill if you only use it twice a year? Why buy a car if it merely stands still in front of your door? By some estimates, one rental car can take the place of fifteen owned vehicles[41], while others keep it at ten.[42] Sharing reduces costs and can

enhance social cohesion (see above). Also the environment benefits when people share consumer goods rather than buying them. Quite some sharing initiatives are bottom-up and have the potential for becoming a viable alternative to conspicuous consumption. They represent the vanguard of a new solidarity and sustainable economy.

However, there are certain conditions to making sharing a full alternative to the consumption economy. First of all, not all types of sharing are the same and have the interest of the user at heart. Rather, while some might involve a mode of horizontal cooperation, this cooperation is nevertheless mediated within a vertical framework that is parasitic upon the direct sharing relationship. Models can be grounded in different modes of cooperation, ownership and value creation. Examples of this are sharing initiatives which are in the hands of one company, that need to respond to the demands of shareholders (e.g. Airbnb) and do not give their clients or suppliers full information (e.g. Uber). From a P2P perspective, it is certainly preferable that sharing is entirely in the hands of peers, leading to a transparent division of property and added value. In other words, ‚sharing' can be accommodated by an economic model that actually goes against its fundamental principles. Members of Freecycle can give away their possessions for free, but because they often do this on Facebook, they become subjects of the big data sales of which Facebook makes huge profits. In other words, capitalist logic might still intrude in sharing initiatives and some of these initiatives are forms of ‚sharewashing':

> Sharewashing does more than just misrepresent things like renting, working, and surveilling as "sharing." It does more than just stretch and contort the meaning of the word "sharing" until it practically loses all meaning. It also disables the very promise of an economy based on sharing by stealing the very language we use to talk about it, turning a crucial response to our impending ecological crisis into another label for the very same economic logic which got us into that crisis in the first place.[43]

Ideally, a sharing initiative follows the principles of a peer-to-peer system and collaboration. The model commits to a societal goal: **dedicated citizens cooperate to make a part of their life more sustainable**. What they create together does not have to be tied to a logic of profit and can instead result in commons.

Sharing initiatives can create value. In a recent press release, the True Price Platform measured the economic, social and environmental impact of four sharing initiatives in the

38 Mont, O., "Clarifying the Concept of Product-Service System", Journal of Cleaner Production 10 (3), 2002, p. 237-245.
39 This company with headquarters in Connecticut, U.S., but active in over 180 countries, was founded in 1906 and offers document technology and services.
40 http://www.strategicdesignscenarios.net/toolkitpss/
41 http://www.economist.com/node/21563280?frsc=dg%7Ca
42 http://www.bondbeterleefmilieu.be/downloads_ftp/bblvAutohndbk_Biwerk_LR_.pdf , http://www.momo-cs.eu/index.php?obj=page&id=146&

unid=2d9d2f5ac157c71c9bcb405c56fcfb3e
43 Kalamar, A., "Sharewashing is the new greenwashing", OpEdNews, 13/05/2013 http://www.opednews.com/articles/2/Sharewashing-is-the-New-Gr-by-Anthony-Kalamar-130513-834.html

Netherlands in 2014. They found that their combined societal impact had a value of 4 million Euro, composed mainly of more and better social relations.[44] This investigation shows that when we are trying to evaluate quality of life, we need to look beyond monetary gains as measured by GDP, but take into account also other factors, such as trust, welfare, health and autonomy. Moreover, it was found that sharing initiatives end up creating more societal value for the supplier than for the demander.

There are nonetheless some drawbacks specifically for initiatives that start from bottom-up. Sharing initiatives with a societal mission warrant inclusion of environmental and social issues, but they often lack an economically sustainable earnings model. To ensure these initiatives survive in the long term and address a diverse target audience, an economically sustainable earnings model is necessary. Furthermore, initiatives often lack visibility for their potential user and need operational support, investment capital and continued innovation.[45]

The government can help to overcome these issues, but the structure of the initiative can also help. One viable option is a cooperative. While cooperatives make a profit as a side goal, every user can become co-owner, and every shareholder's voice carries the same weight in the decision-making process. The cooperative sector is still small, but is growing and holds a lot of potential. A paradigm shift from owning to sharing with the user can cause a paradigm shift with the producer, which can be mutually reinforced. As David De Ugarte, entrepreneur committed to new models of economic democracy, puts it, *"the sharing economy needs the cooperative model as a counterbalance, because if not, it will end up devoured by the investment funds bubble."*[46]

4. ROLE OF THE GOVERNMENT – TOWARDS A POST-FOSSIL DEMOCRACY

Politics has always shaped economic development. No Internet without the US military, no railway system and no automobility without huge public investment in research, financing and infrastructure building. Currently, a lot of pub-

lic money is still used to subsidise multinational firms in old industrial sectors, like oil, car, nuclear energy and armament. They are sustained by huge public funds and regulations, EURATOM being only one of many examples. In enabling new types of initiatives such as sharing, public money and public rules have to be oriented towards other objectives, thereby strengthening other actors and activities.

Democratic governments at all levels — municipal, regional, national and European — have a twofold responsibility. First of all, governments must modernise their regulatory frame so as to also encompass new players on the market, such as Uber. Obstructing innovation is foolish, but should we accept corporate actors who clearly do not operate in society's interest? Do we really want to replace cab drivers by underpaid freelancers with precarious statutes?

Secondly, the government needs to offer a legislative framework that supports citizens' initiatives instead of working against them (for instance making shared ownership of a property or land easier). Also regulations for crowdfunding must be considered: a legal framework to allow for investments based on crowdfunding is desirable. Furthermore, the government must create a legislative framework for quality control and liability for products made on a peer-to-peer basis for every different path of ecological production. To foster a general sense of trust and thus increase the number of collaborators, the open source communities need a mechanism for accountability and fairness[47].

In the case of the circular economy, public and private sectors have complementary roles. Regarding waste, the public sector must boost collection, enforce conditions for waste shipment, define and enforce recycling standards and promote innovation design, which would allow for a quick dismantlement of products. The private sector must develop new technologies, invest in new recycling capacities and reach out to the entire value chain to build a robust circular economy.[48] Together, all stakeholders must strive for increasing the recycling performance, maximise the re-use of materials and minimise the leakages out of the circular economy . To achieve a true performative circular economy, cooperation along the full value chain is crucial and that is where legislation plays a key role[49].

44 True Price, "Deelinitiatieven creëren miljoen euro maatschappelijke impact", 17/02/2015 http://trueprice.org/press-release-d/tch-4-miljoen-euro-maatschappelijke-impact-door-te-delen/ The platform uses the Life Satisfaction Approach, as described in their ,Principles on Methods for Impact Measurement and Valuation http://trueprice.org/successful-platform-consultation-principles-methods-impact-measurement-valuation/
45 E-book Product-Dienst, Plan C, 2013, http://issuu.com/plan_c_be/docs/product_dienst_25022014_31c1093d1f755c?e=10276462/6789962
46 http://www.guerrillatranslation.org/2014/11/15/the-death-of-the-labor-market-an-interview-with-david-de-ugarte/

47 Yasir, S., Brastaviceaunu, T., Open Value Network: A framework for many-to-many innovation, Sensorica Blog, 22/11/2013, http://sensoricablog.blogspot.ca/2013/11/blog-post.html
48 Csoma, S., "Circular economy towards a resource-efficient society", 24-27/05/2011, http://www.umicore.com/img/uploads/irpresentations/29/2011May_GreenWeek.pdf
49 Lox, E., "Thought Leader Green week 2014", The Parliament Magazine, 28/05/2014, https://www.theparliamentmagazine.eu/articles/sponsored_article/thought-leader-umicore-green-week-2014

5. BEYOND JOB CREATION

In the shift to a society that permits a good life for all, a key re-orientation is necessary. Many of the social and ecological activities that take place and are decisive for resilient communities are not based on paid work: care for children and the elderly; volunteering in energy or food cooperatives; cultural or sports activities and involvement in local politics or social movement activism. All these non-paid activities sustain the economy and will become more important in the social-ecological transformation. Reduction in working hours for paid work is a necessary strategy to combat unemployment, but also to increase the available time for other essential human activities.

Nevertheless, having a job and earning a living remains decisive for a good life. Foreseeing how many jobs would be created in peer production is difficult, because it breaks away from the classical pattern of work-for-pay. Some predictions can be made for jobs in the more traditional economy. We can reasonably expect job creation from the use and recycling of valuable by-products and scraps. The waste management and recycling sector in the EU25 has already provided 1.2 to 1.5 million jobs.[50] It is estimated that for every 70 to 300 tons of WEEE collected (taking into account collection, dismantling, pre-processing and smelting), one job is created. By increasing WEEE collection from 30% to 65%, or from 3.1 million to 6.5 million tons, a minimum of 12 000 jobs would be created.[51] The European Commission stated that *"Material recycling from waste creates 5 to 7 times more jobs than disposal by incineration and 10 times more jobs than disposal in landfills."*[52] The European Environmental Bureau estimates that the circular economy will create between 600 and 800 000 additional jobs from recycling and reuse by 2025, depending on the ambition of the scenario.[53]

Common-based peer production processes still face daunting challenges because of their unique nature. Although crowd-funding promises to be a great source of funding, *"it remains challenging for fund receivers to track and redistribute income to the investors in the 'crowd' [...]. In fact, any revenue generated for the community is redistributed to only a core group of individuals."*[54] Moreover, a new governance structure must be created in order to mitigate the difficulties of competing with traditional producers. An Open Value Network (OVN) might be an intelligent response to these questions. This is an open network that builds upon the principles of open source, but is made up of open enterprises that can perform all the functions of traditional enterprises. They foster the structure of open collaboration and seek a performative advantage. Any member within the OVN can create a legal entity to assume the liability of the product including the appropriate use of brand trademarks. This liability could have any legal structure, from a private ownership[55] to a cooperative ownership and could be open for use by other members, if they abide by the conditions and terms set in a liability charter. An OVN offers mechanisms to capture value by providing structure and infrastructure to track each contribution within a project.

6. NOT TO CONCLUDE

In this paper, it became clear that the difference between the classical economic schemes, such as product innovation based on patents, selling and buying the maximum amounts of product and new schemes, such as peer-to-peer production, sharing initiatives, cooperatives and product service systems, have far-reaching consequences. These consequences need to be carefully considered. Karl Polanyi's reflections on an embedded economy might help to reframe priorities and reaffirm the primacy of collectively and democratically shaping our planet. Facing the ecological challenges courageously means liberating ourselves from conventional thinking and dedicating ourselves to the effort to realise the societal changes that we envision. The four pathways to ecological production discussed in this paper are hopeful experiments for the future and their development should be encouraged.

50 European Commission's Thematic Strategy on waste prevention and recycling

51 Cited from CRI, "Present and potential future recycling of critical metals in WEEE", 2012, http://www.cri.dk/sites/cri.dk/files/dokumenter/artikler/weee_recycling_paper_oct14.pdf, on the basis of recycling figures and experiences from Germany (Remondis, 2005) and Switzerland (Sinha-Khetriwal 2005).

52 EC Staff Working Paper accomanying the proposal for a Directive of the European Parliament and of the Council on waste electrical and electronic equipment, 3/12/2008, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2008:2933:FIN:EN:PDF, p. 49

53 According to their ambitious scenario, they calculate that with intense reuse and 70% of recyling, 1/6 unemployed youth can get a job. EEB, Advancing resource efficiency in Europe, 2014, http://www.eeb.org/EEB/?LinkServID=4E9BB68D-5056-B741-DBCCE36ABD15F02F

54 http://sensoricablog.blogspot.ca/2013/11/blog-post.html
55 http://sensoricablog.blogspot.ca/2013/11/blog-post.html

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