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Executive Summary

This deliverable introduces Community Currencies (CCs) as a novel strategy toward economic sustainability of Community Networks (CNs). It does so by developing an analogy between community networks and community currencies as two separate local action and self-organization schemes that have evolved in parallel until today.

We define 6 key characteristics of CNs and CCs that allow the identification of important differences and similarities between the two models. Based on this comparison, we describe in more detail two success stories of each domain as a case study, i.e. Guifi.net and Sardex.net, which will empower the design of interesting combinations between the two models. Such combinations will provide opportunities for local businesses to become part of a local economy that can give them direct access to local customers, but also help sustain the CN infrastructure on which this activity takes place. At this stage, we propose four possible areas of research and action:

1. The design of a community currency for an existing CN, combining ideas from the design of Sardex.net and a novel commons-based currency, the District Currency, with focus on Guifi.net as our main target case study;
2. The design of a process that will allow a CN, again with focus on Guifi.net, to become part of a wider local economy run through a community currency compatible with the current efforts of the municipality of Barcelona toward this end;
3. The design and implementation of suitable educational games that will help the dissemination of some core ideas behind the envisioned approach both to practitioners and the wider public;
4. The development of suitable models and tools that will facilitate the design process and demonstrate the possible positive effects of combining CNs and CCs.

In this context, we analyse a set of important challenges that we need to address to this end: the lack of understanding of the reasons behind the need to separate between Internet access and local services offered in a CN; the sometimes undesirable quantification of voluntary activities implied by certain CCs and their unpredictable effect on paid work and economic sustainability; the hype of cryptocurrencies that shift the focus from the hard work required to build trust and community to magic solutions brought by technology; and finally the significant amount of human resources required to make such systems successful - systems that are difficult for the protagonists to take the risk and engage in the long-term process, combining mechanisms complex to understand and difficult to implement in practice.

We conclude with a few concrete steps, the most important being our presence in the International Conference on Social and Complementary Currencies in Barcelona in May 2017, titled “Money, Awareness and Values for the Social Change”. A great opportunity to open the discussion in a city whose municipality has recently decided to move forward with a plan to introduce its own currency.





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List of Acronyms

CN	Community Network
BCN	Barcelona
B4RN	Broadband for the Rural North
CAPS	Collective Awareness Platforms for Sustainability and Social Innovation
CC	Community Currency
CCs	Community Currencies (plural)
CN	Community Network
CNs	Community Networks (plural)
CONFINE	Community Networks Testbed for the Future Internet
DAO	Decentralized Autonomous Organization
eXO	The Association for the Expansion of Open Network
FLOSS	Free /Libre Open-Source Software
GFOSS	Greek Free/Open Source Software Society
ICT	Information and Communications Technology
ISP	Internet Service Provider
LETS	Local Exchange and Trade System
VOIP	Voice Over Internet Protocol





1 Introduction

This report examines the question of sustainability of Community Networks from a forward-looking perspective on how a higher economic sustainability could be achieved. More specifically, it first aims to introduce the concept of community currencies to community network practitioners as a potential mechanism for economic sustainability that is based on local resources and can, first, help the proliferation of community networks and, second, make them an integral part of a commons-based local economy. The long-term objective is to look at the economic sustainability through new community currencies that are intended to serve sustainable economic transactions and relations. The exact relation between sustainability and currencies and its evidence will be estimated in next steps, based on empirical data and specific case studies.

To explore the potential of such a proposed “marriage” between community networks and community currencies we focus first on clarifying some important similarities and differences between the two models, in the form of an analogy exemplified through two important success stories in these two domains.

Notice that most (wireless) community networks (CNs), are built today out of the individual contributions of the community members (time, money, hardware and software). The most common image behind the construction of such a network is the mounting of antennas on rooftops, which create wireless links that can cover from small to large areas. Successful community networks like Guifi.net and Freifunk.net include in their common infrastructure also fiber cables, and more.

The resulting networking infrastructure could be used to offer access to the Internet, e.g., in rural areas where commercial ISPs do not have a benefit to invest, and/or a wide variety of local services in the geographic area covered by the network. The latter has been always considered as one of the big advantages of community networks but until now it has not delivered its promises for various reasons. The most important one is that the Internet could in principle very well support local online interactions. And the majority of people do not care if the platform offering the corresponding online services, is based very far from the target area; if big corporations completely disconnected from local institutions own it; and if sensitive private information needs to be gathered to ensure that those interacting are indeed in physical proximity.

Is it possible to build “more ethical” platforms that operate on a global scale? Or should we focus on local solutions that are in principle more “complementary” than “alternative” to the Internet and consider scaling up at a later stage? And in this case, should network infrastructure be clearly separated from the services offered on top of it? Are we homo-civicus, sensitive to the collective implications and local effects of our individual choices, or are we homo-oeconomicus, purely driven by the cheapest or free of charge?

Advocates of community currencies face similar challenges. For example, community or complementary, or regional, or alternative, or social currencies are also subject to the “why?”



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question. As the global Internet can support local communications, similarly the globally established national currencies like the US-Dollar or the Euro (also called fiat money) are perfectly capable of supporting the functionality of a local community currency, i.e., the exchange of goods and services in localities, avoiding the limitations and the increased risk of failures introduced by an extra currency limited to a specific geographic location.

As in the case of communication networks, most people do not feel empowered or even allowed to operate their own local economy with their own currency. **“Is it legal?”** is often the next question when one explains the multiple benefits of a local community currency. The answer is that, depending on its scale, a local currency could be more or less easily designed to be perfectly legal. But for this to happen, it requires the mobilization and cooperation of many different actors and a broader awareness of how the economy works and why local currencies are indeed important for reasons like sustainability, resilience, social learning, self-determination, and more.

The same holds for community networks, which similarly to community currencies are not well understood by the wider public and face various social, political, economic, and educational challenges. More specifically, both of them have to compete with global institutions with tremendous power, require a level of social cohesion and local collaboration that is more and more difficult to assume, and offer solutions that are complex to implement and prone to failures.

They also share similar long-term objectives: to reduce digital (for CNs) and economic (for CCs) divides, which often depend on each other, to offer easier access to information and services, to promote local social and economic development and employment, and to strengthen the local identity and culture.

But not all community networks and not all community currencies are the same. Most importantly, there are different relations to the global system, the Internet and the global economy respectively, for which such platforms provide an alternative local solution. We could call these different “levels of complementarity”. For example, the most well-known community networks in rural areas or big cities like Barcelona, Athens, and Berlin, are mainly perceived by outsiders as free or cheap gateways to the Internet failing to understand the significant differences between them on how this is achieved. And when they do support “local” interactions in addition to providing Internet access, the latter are mainly appreciated and practised by those who contribute in the construction of the network, the members of the “community”, typically tech enthusiasts and hackers.

There are some exceptions of wireless community networks that have attempted to engage the local community in a more inclusive way, as is the case with the Redhook WiFi initiative in Brooklyn (Baldwin, 2011) and various “offline” networks with a more artistic and/or political character, like PirateBox and qaul.net but their overall impact is still rather limited. Guifi.net is a special case that distinguishes between the network infrastructure and the services provided on top, including the Internet connectivity.



The ecosystem of community currency schemes is rich, with numerous important design variables that generate a very complex design space. There are solutions centered around small and medium size businesses such as WIR in Switzerland and Sardex.net in Italy; others expanding this idea towards customers, such as RES, originally in Belgium now expanding to Catalonia/Spain. Others focus on supporting regional economy and sustainability as the English transition currencies Totnes Pound, Brixton Pound or Bristol Pound or the German Regiogeld Chiemgauer. There are examples of currencies with social and environmental motivations like Torekes in Gent/Belgium or Spice Credits in England and there are many hundreds of time-banks and LET-Systems worldwide (see chapter 3 for detailed information about these currency schemes).

In the following, we start with a parallel introduction of community networks and community currencies as collaborative commoning activities, around several key characteristics:

1. The “common” resource (characteristics, properties),
2. Community building (bootstrapping, membership, vision),
3. Managing the commons (participation, accounting, rules, decision-making),
4. Boundaries and complementarity (interactions with the global system),
5. Scaling up (distributed vs. centralized architecture),
6. Computer-support tools (proprietary vs. free software).

Describing community networks and community currencies in parallel will already reveal many similarities and differences. However, the goal of this report is not only to highlight those similarities but engage in a discussion that will allow to learn from each other's successes and failures and propose novel models of community currencies either for the internal management of the CN resources or for integrating a CN in a wider local alternative economy.

To this end, we present in more detail two success stories, and somehow special cases, in these two domains: the community network Guifi.net and the complementary currency Sardex.net. We discuss their particular interpretation of complementarity, how they managed to scale, and the key compromises that they had to make on the way. This will lead us to the final argument on understanding better the concept of “complementarity” in the case of community networks, inspired by the importance that this has played the last years in the case of community currencies.

This analogy and knowledge-sharing exercise between these two different domains of collective action, will then hint at possible integrated models of both complementary networks and currencies in specific geographic areas. For example, an appropriately designed complementary currency scheme can place a community network into a broader local economy that enables the provision of incentives for investments in infrastructure and effort for deployment and maintenance of the network, on the one hand, and, on the other hand, the inclusion in the community of people and companies that do not have ICT expertise, but can bring other resources and expertise. We will touch on these issues at the discussion section and leave the more thorough analysis for the next version of this deliverable.



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But before laying out the different elements of our analogy, we include below, for completeness, a short overview of existing sustainability strategies followed by today's CNs and an introduction to different types of community currencies worldwide. We conclude this first version of this report with a set of concrete next steps that we plan to undertake toward our ambitious objective.



2 Economic sustainability of Community Networks

The issue of economic sustainability is one of the key challenges of Community Networks today and it has been already addressed by the netCommons deliverable D1.2, Report on Existing Community Networks and their Organization; the phased deliverables D2.1 and D2.2, The Multiple Aspects of Politics of Sustainability in Community Networks: Definitions, Challenges and Countermeasures; and, to a smaller extent, by D2.3, Incentives for Participation in CNs (v1).

As a short summary, we identify below several complementary strategies that have been followed, individually or in combinations, by existing successful CNs:

Voluntary contributions from members

This is the most common source of contributions based on which many existing Community Networks have managed to thrive, like AWMN in Greece, Ninux.net in Italy, Wlanslovenja, and Freifunk.net in Germany.

These networks have reached a significant scale relying mostly on its own members' investments in time, effort, and equipment. To achieve this remarkable level of participation (e.g., Freifunk counts today more than 40000 individual nodes), these networks have developed strong feelings of community and intrinsic motivations related to the commitment toward a more democratic, private, secure, and neutral Internet offering affordable access to all.

Donations from external supporters

In addition to the significant contributions by their own members, Community Networks are often financed through crowd-funding projects or direct, regular or one-time, donations.

Freifunk.net offers a good example of attracting such support through a dedicated non-profit organization, which is meant to require as little as possible (voluntary) effort. For this reason, it has a relatively small number of regular members and a large circle of supporting members, which can all participate in the annual general meeting. The membership includes a “fee of either 60 EUR (or more) per year to the Association's account as annual sponsor membership, or the monthly equivalent of 5 EUR (or more) for sustaining membership.”¹

Funding from institutions

Many CNs have received seed or supporting funding by local or international institutions such as foundations, research funding programs, municipalities because they provide vital services to citizens in cases where the market fails as in the case of rural areas and/or underprivileged population like refugees.

¹ see <https://foerderverein.freie-netzwerke.de/mitgliedschaft/>



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A good example of such a community network is Sarantaporo.gr CN. They managed to establish a network that offers today broadband Internet access to 14 villages in a rural area in Greece with limited or no fixed network connectivity. This particular network was built initially by a small team of young activists who received hardware by the OpenWifi call of the Greek Free/Open Source Software Society (GFOSS), and funding by the EU project CONFINE to develop a community network as a “testbed” for experimentation on future Internet technologies (Navarro et al, 2016).

Commons-based policies

All aforementioned sources of financial support are one way or another not guaranteed, and they make long-term strategic planning difficult. They could also lead to disagreements and conflicts between members on its distribution inside the network, especially if there are not well-defined decision-making processes.

When the infrastructure costs are high, it is often the case that CNs are organized around formal organizations such as the Dutch broadband co-operatives, studied by Sadowski and others in 2014, in which large numbers of local community members join and pay membership fees in order to set up fibre networks. The network B4RN in the area of Lancaster in the UK (discussed in detail in deliverable D2.2) is another example.

Guifi.net has developed a unique model combining voluntary and professional services in a commons-based approach on building and managing network infrastructure in a way that is sustainable, fair and non-profit, based on a novel compensation scheme (Baig et al, 2016). The participants who use a significant amount of resources from the infrastructure commons are obliged to sign an agreement for economic activities and for the participation in the compensation system. In simple terms, the compensation settlements are aimed at ensuring: i) a fair distribution of the network operation costs based on use of the resources, and ii) the generation of the required resources to recover the investments made or to enable future ones.

The compensations are implemented by balancing between the contributions or the expenses of each participant and their use of the infrastructure commons. The balances are calculated by periodically applying the current compensation criteria.

The resulting amounts are settled between the Foundation and each participant either in cash in the case of the installers or by placing them as an accounting entry to a bank account held by the Foundation (the so called compensation buckets) in the case of the operators (i.e., those who have recurring income). In the latter case, if the resulting amount is negative, the participants must make a deposit to settle it; if it is positive, they can use the funds to reinvest according to their needs or interests. These compensations occur as specific areas, the compensation tables.

While in some tables only professional participants are included, in others, voluntary work and contributions from volunteers under a local association can be accounted and included in these compensation tables, such as the case of eXO association with a recently constituted compensation



table in Barcelona. This allows including in the balance from both professionals and volunteers under an agreement of stipulated valuations of different contributions, which creates an opportunity for the introduction of community currencies in this scenario of virtualized and stipulated value for contributions to the commons. The details of this compensation model are described in deliverable D1.2, section 3.2 and the specific case of eXO is detailed in section 3.3.

Access to public infrastructure

Being non-profit, official or unofficial organizations, CNs are often granted access to public infrastructure in favorable terms. For example, Freifunk.net nodes are often placed on churches and the Sarantaporo.gr network has been offered free Internet access by the University of Applied Sciences in Thessaly (see D1.2 and D3.1).

However, there are also cases in which CNs are treated unfairly in comparison with traditional providers as in the case of Barcelona's access network. The guifi.net Foundation and its local partner, the eXO association (see D1.2), have discussed the terms of usage of the public city-wide WiFi infrastructure and the city fibre infrastructure. In both cases, the inherited situation is that both services were privatised (a concession to private operators, with strict conditions and long terms) that prevent the open access to this infrastructure in reasonable terms. Therefore, the BCN-WiFi² infrastructure consisting of about 600 Access Points (a large number in the statistics for such a large city, but clearly unpopular service with usability, speed, coverage and reliability problems) is privately managed. The public fibre infrastructure and the conducts are also under a long-term concession that provides service to the municipality but impedes any other practical usage of that infrastructure.

Despite the obstacles in deploying infrastructure and services in the city of Barcelona, guifi.net around Spain benefits from more favorable policies in terms of access to public infrastructure (e.g., for laying out fibre cables) compared to other countries.

Partnerships with local authorities

A good model for community networks seems to be a hybrid/co-operation of commons/public service with civil society/municipality, in which civil society projects co-operate with municipalities (e.g., Forlano et al, 2011; Powell, 2006; Powel et al, 2008). So, the survival problems of alternative media may be limited if one can find models in which municipal power and civil society commons are not seen as opposing each other, but acting cooperatively as antidotes to the mainstream and profit-making media outlets.

The guifi.net Foundation has developed a cooperative infrastructure sharing model (the "Universal" deployment model) that develops over the Directive 2014/61/CE on broadband cost reduction of the

² <http://www.bcn.cat/barcelonawifi/en/>, accessed 23.12.2016



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EU (EC, 2014³) and the infrastructure sharing concept of ITU (ITU 2008⁴) to regulate the details of how municipalities and counties can regulate the use of public space by private, government and civil society in a sustainable manner. The proposal is written as a template municipal ordinance to be used by municipalities to regulate this complex aspect correctly and fairly and, therefore, reduce the barriers created by uncertainty in these topics that usually escape the knowledge of municipal governments. Several municipalities are evaluating the proposal that was initially the result of a request from the Osona county (See WS report 2016⁵ as part of DC3 report⁶)

Market-based policies

It is often the case that economic sustainability is linked to for-profit activities and there are commercial networks that indeed rely on such policies ranging from standard pay per use contracts, like in the case of some of the FFDN networks, advertising other added value services to external customers. Also, Kinmuck network in Aberdeen, which is served by a technical enterprise, which charges standard contracts in an area where there is no Internet (they provide fibre infrastructure).

Incentive mechanisms

Another strategy in ensuring the economic sustainability of a Community Network is making it attractive in the first place. The description of the vision and key principles, the public image, the availability of Internet connectivity or not, the existence of local services of good quality, the participation rules, are some of the important aspects that motivate people to join a Community Network either as contributing members or simply as users. These strategies are discussed in more detail in Deliverable 2.3.

³ <https://ec.europa.eu/digital-single-market/en/news/factsheets-directive-201461ce-broadband-cost-reduction>, accessed 23.12.2016

⁴ https://www.itu.int/ITU-D/treg/publications/Trends08_exec_A5-e.pdf, accessed 23.12.2016

⁵ <http://people.ac.upc.edu/leandro/pubs/igf-dc3-ws.pdf>, accessed 23.12.2016

⁶ http://internet-governance.fgv.br/sites/internet-governance.fgv.br/files/publicacoes/community_connectivity_-_building_the_internet_from_scratch.pdf, accessed 23.12.2016



3 Community currencies

This chapter start to explore a synergy between CCs and CNs: the use of community currencies as a potential means to ensure the economic sustainability of CNs, which is somehow “orthogonal” to the rest of the mechanisms summarized above. It introduces a new means for accounting for individual contributions and a support system including credit limits, brokering, exchange rates, etc., for making sure that the overall ecosystem will stay in balance, either internally or externally, the latter allowing the connection of CNs deeper to their social and economic environment.

3.1 A short introduction

There are different approaches to characterize currencies that are not national currencies (legal tender or fiat money), leading to different designations (compare Robertson 2012, p.157):

- *Alternative* is maybe the broadest term, indicating all non official currencies but also a competitive approach towards the dominant national currencies;
- *Community*, or *Social* emphasizes a democratic and social goal and a benefit for the society promoting self-help and caring, and often focusing on social projects and services which are not part of the mainstream market economy;
- *Complementary* indicates a more cooperative relation towards national currencies, complementing where they do not succeed, while staying compatible with them (e.g., paying taxes);
- *Barter* is a term mainly used by business exchange, sometimes meant to be goods vs. goods but in most cases using mutual credit and a certain unit to handle it;
- *Regional* or *Local* are terms often used to stress on the limited geographical area where community currencies apply.

In this report, we use the most generic term “community currencies”, since this is also used for the case of networks, and the term “complementary” for the special category of community currencies like Sardex.net that we want to draw attention on.

Economy & Functions

In general, every currency is a dynamic processing system, by which the division of labor (or contribution in general) becomes feasible, exchange is managed, wealth and incentives are distributed, wealth is shifted through time (“stored”), value is made comparable among valuable items and an important part of the daily communication is worked out. All these functions cannot be carried out with the same degree of fulfillment by just one type of currency, and this is why using two (or several) parallel (or complementary) currencies could lead to much better results.



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Some more generic functions of alternative and community currencies in relation to the mono-currency-area of national economy include the following:

- A second currency creates automatically a secondary “closed economy”. A trading border occurs, or existing exchange borders are moved. Therefore, the option to discriminate between the “internal” and “external” is provided;
- Existing exchanges can be substituted with the second currency, or an area which was not “monetized” before can be included;
- The preferences and the behaviour of the users of a new currency are shaped according to its design, and this allows for the evolution of different cultures, to a certain degree, compared to the surrounding society;
- A second currency enables the users to choose in which economy to make a transfer of value, based on possibilities or needs: in the open and boundless fiat-money-economy or in the closer and joint community-economy.

Advantages / Disadvantages

A well designed CC can provide the following advantages:

- Unleash blocked economic potential (unmet needs and unused resources because of the lack of money),
- Lessen the included indirect costs, especially much less burden of indirect interest (in all normal prices costs of paying interest are included: In daily food around 30%, in housing rent more than 60%, see Creutz, 2006, p.12),
- Strengthen local exchange, therefore reducing transport, traffic and energy consumption,
- Stabilize and support local SMEs, therefore also reinforce local employment,

As a CC is a smaller system the following disadvantages have to be taken in consideration:

- Higher direct transaction costs,
- Limited validity, limited area of use, limited use in time,
- High sensitivity to imbalances in the overall economy,

(see Martignoni, forthcoming)

3.2 A classification of community currencies

Community currencies have not yet been categorized according to a standard scientific classification or typology. This is due to the fact that currencies as socio-technical systems did not attract much attention by scientists until today, except by ethnologists, who studied the subject of



native or “natural” currencies and discussed this in or economic anthropology. Still there are some first efforts to classify the different existing currency schemes.

Martignoni (2012, p.2) writes: *“How can complementary currencies be categorized? Surprisingly, there are only a few coherent classification systems on the subject in the literature and these mostly start from the traditional understanding of money taught by economics, which can hardly capture the special features of modern complementary currencies.”*

One of the first and a quite extensive typology was the one by Kennedy/Lietaer in their book *Regionalwährungen* (2004, in German). Later the authors together with Rogers simplified their classification in the completely rewritten English version *People Money* (Kennedy et. al. 2012). Other efforts on typology and classification of complementary or community currency were carried out by Jérôme Blanc (2011), Jens Martignoni (2012) and Tichit/Mathonnat/Landivar (2016) all published in the *International Journal of Community Currency Research*. All four are very different between them and do not rely on the others:

- Blanc identifies Community currency generations resulting in an evolution-oriented model of four classes (G1-G4);
- Martignoni develops a more complex universal scheme for all currencies with an emphasis on the purpose of the currency. The typology includes four dimensions clustered into two separate aspects: the basic currency concept and the technical design;
- Kennedy, Lietaer, and Rogers (2012) divide regional currencies according to two principal variables: their main purpose (i.e., to support the local community or to strengthen the community) and their core mechanism (circulating currency or mutual credit);
- Tichit/Mathonnat/Landivar use a lexical analysis of web-data to cluster the terms and find out five classes in a dendrogram (Tree-based diagram).

The classification of currencies per se is very challenging as various viewing angles can be taken into account and a currency is always very context-specific and very closely linked to a fluctuating value system.

Keeping in mind that our main concern is to address the question on how to use community currencies together with community networks and at the same time introduce the main ideas to non-experts, we will base our own classification on the basic concepts developed by Blanc, but modify them according to practical considerations related to our research and new developments in the field like cryptocurrencies. The resulting classification is not exhaustive but it helps to understand the basic elements of the most popular approaches.

We define the following clusters or classes:

- A) LETS and Time Banks (Blanc G1 and G2),
- B) Local Currencies (Blanc G3),



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- C) Incentive-Currencies,
- D) Business currencies,
- E) Cryptocurrencies,
- F) Commons-based currencies.

The next chapters will explain this classification and use some existing examples to illustrate the main ideas and prepare the ground for the comparison and adaptability discussion.

3.3 LETS and Time Banks (A)

Description of Class

A widespread form of complementary currency is known under the abbreviation LETS, which means Local Exchange Trading System. The LETS concept was developed till 1982 by David Weston and Michael Linton in Canada and is based on mutual credit between individuals using a centralized database ledger to maintain the system. In the meantime, the original form has developed and spread over the world. LETS can now also be called Local Employment and Trading System or Local Energy Transfer System.

At the same time in the 80ies Edgar Cahn, a US legal professor developed the concept of time-banking. Time banks differs significantly from LETS as follows:

- The unit of currency is time. An hour of any type of work is considered equal. This leads to a different valuation system;
- The focus is on social activation and network creation. It is not a real crisis currency and also no change in the current monetary system is intended.

The idea of both of these schemes is based on the individual as reference point and stretches the (questionable) idea of money as a medium of exchange between individuals.

Features and Advantages

Some main progressive steps in currency design were made by LETS that includes:

- Proposing an “absolute” mutual credit system whose overall balance would always be zero;
- Proving a closed and transparent system as a valuable currency system which is obviously very resistant against fraud or cheating;
- Using an IT-powered central database for the ledger.

The additional ideas of time banks were mostly already thought before like the idea of labour-time as an anchor of a currency e.g. by Robert Owen and Josiah Warren (see Crispin, 2011). New was the claim for absolute equality of each person’s labour-time, be it a lawyer or a cleaner. Therefore, the equalizing valuation-system is the core of time-banking.



The difference between a time bank and a time-exchange-system is mostly the intention of storing or saving time for a longer time like a pension for the time after work (time bank), against using it right now to intensify the possibilities of today (time-exchange).

Technically LETS and time banks can use the same software and be hosted on the same server and trade among each other easily whilst they are rooted in the same idea of individual labour as the foundation of their economy.

Example (LETS): CES (South Africa/Worldwide)⁷

The Community Exchange System (CES) is a South African web service that provides a platform and tools for communities to set up and manage exchange and trade in their areas without using official money.

The inventor of CES is the South African writer, former political prisoner and a monetary activist Tim Jenkin. He proposes the following basic economic idea as background of the System: *“Trading in this system requires no supply of money, either by the community as a whole or by each user. Instead of using a ‘hard’ currency, which then has to be allocated by some authority according to a formula, the ‘currency’ of this system is the pure metric of the values exchanged in trade. It is a true moneyless exchange system that performs all the functions, and more, of a conventional money-based exchange system.*

The main object of the CES is therefore to facilitate trade and exchange by providing a range of non-monetary exchange methods.”⁸

The CES serves two basic functions:

- it is an online exchange system that facilitates exchange in a number of different ways;
- it is an online ‘marketplace’ where users advertise their skills, offerings and requirements.

CES is an internet-based site and works like an online banking service. Each user has to join an existing community (or open a new one himself) most likely in his area. They then get an account number and a password to access their account on the CES web site. The users can enter payments and transactions, view their current balances and obtain statements of account. They can also keep track of the trading position of others: *“Those without computers can interface with the system through local-area coordinators, who serve as local ‘branches’ of the exchange. Coordinators are trusted users who have rights and facilities to perform actions on behalf of others.”⁹*

The CES provides a number of methods to facilitate exchange.

- Marketplace (Offerings List) for goods and services. Users can advertise their offerings as gifts, for organised barter, to swap for something explicit or for trade in their local currency;

⁷ <https://www.community-exchange.org/>, accessed 20.11.2016

⁸ <https://www.community-exchange.org/>, accessed 20.11.2016

⁹ <https://www.community-exchange.org/>, accessed 20.11.2016



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- If gifting, bartering or swapping is used, the traders make their own arrangements about how it is done and no records need to be kept;
- When using ‘payment’, the seller is debiting the buyer online or in case of offline transactions, issue a cheque-like Trading Slip that serves both as a means of payment and a receipt for the goods or service;
- The information on the Trading Sheet or Slip is entered by the seller into a transaction form on the web site. This credits the account of the seller and debits that of the buyer. Accounts record these debits and credits;
- Predefined limits for negative and positive balances.

Like in the classical LET-Scheme a positive balance represents a claim against the community while a negative one represents a commitment to provide goods and services to the community. To prevent a misuse of the system, details of each user’s overall trading position are available to all. The web site also provides all the information needed to contact other users. This transparency is seen as a crucial issue in such a currency. General trading statistics are also available for all.

Currently (2016) there are 883 CES exchanges in 83 countries hosted on the main server in South Africa. There are two more servers in Australia with additional CES exchanges (groups): *“Each exchange has its own ‘currency’, ‘trading space’ and administration but the users of one exchange can trade with the users of other exchanges, making trading with CES even more convenient than trading with conventional currencies.”*¹⁰

Most of the CES exchanges are linked into a global Community Exchange Network, which includes other, non-CES, trading systems. The Community Exchange Network was the first global network of communities using alternative exchange systems, and remains by far the largest. This system works with a framework of conversion rates and predefined trading limits and permits seamless trading between the hundreds of different ‘currencies’.

*“However, to make these ‘currencies’ meaningful to users, their units of value or account are usually referenced against national currencies or time. This helps users to price their offerings. Those exchanges that use the national currency as their price reference are in no way tied to them and can decide to deviate from them in times of rapid inflation. There are no rules for pricing in the CES: the ‘law’ of supply and demand prevails.”*¹¹

Example (Time Bank): Tauschen am Fluss (Switzerland)¹²

A typical time-exchange is the *Tauschen am Fluss* (meaning exchange or swap at the river) in Zurich. It was founded 2006 as a joint initiative of a community center and local citizens and was

¹⁰ <https://www.community-exchange.org/>, accessed 20.11.2016

¹¹ <https://www.community-exchange.org/>, accessed 20.11.2016

¹² <http://www.tauschenamfluss.ch/>, accessed 22.11.2016



supported by the city council to improve the neighbourhood in a certain area of Zurich. Tauschen am Fluss is located at one of the Zurich community centers called GZ in the quarter of Wipkingen and is now supported and co-financed by the City-based GZ-organization. The Tauschen am Fluss network is organized as a club (legal association). The association is led by a board and supported by a team of employees, who take over the administration and advise members on all questions and concerns about exchange and swapping.

The members offer their talents and skills, which they also enjoy doing. Services, knowledge and skills, self-produced goods and second-hand goods are exchanged. The payment unit is one hour. One principle is that all services are equivalent. For example, one hour of window cleaning is worth as much as one hour of Spanish lessons. Each person has an account on the Internet (on a Cyclos based platform) with account limits of 30 plus and 30 minus hours. The network has about 300 members mostly in the city district around the headquarters at the banks of the river Limmat in Zurich and is very successful in maintaining a high level of activity.

3.4 Local Currencies (B)

Description of Class

Most probably the initial idea of the re-localization of a currency came from Germany, where it builds on the historical foundations of Freigeld (free money), but also included international experiences. A group in Bremen started the ROLAND regional currency in 2001 (see Gelleri 2008, p.158). The ROLAND was designed with a 1:1 relation to the Euro, worked according to a check system and presupposed a membership in the carrier association.

The currency was fully backed by Euros and had to be bought (exchanged) by the customers and was allowed to be redeemed with a deduction by the businesses. Shortly after, the Chiemgauer in Bavaria was created and put it into practice (Kennedy/ Lietaer. 2004, p.104ff.). The Chiemgauer was also conceived as euro-covered shrink money and used bills, which had to be covered regularly with toll stamps and linked this additional upgrading money elegantly with culture and sports promotion of regional clubs.

In France, the so-called MLC (Monnaie Locale Complémentaire) is built according to a similar pattern. In Great Britain, the town or city-centered transition currencies are comparable. These concepts overlap strongly. Here we include them all under the category “local currency” as proposed by Blanc.

Features and Advantages

The main feature of such local currency is its linkage and exchangeability with the official/national currency. It therefore can be named a voucher and fits in very nicely into the usual taxing systems or other regulations. Because of its closeness to the existing money many operations also can be done exactly like normal, e.g. the 1:1 exchange rate omits price calculations and simplifies all



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transactions. The main effects of such a currency are identified through changes of the behaviour of the users. They might prefer local businesses and avoid saving the currency, resulting in a higher local liquidity and purchasing power.

Example: Chiemgauer Regiogeld (Germany)¹³

The Chiemgauer goes back to a student company at the Waldorf School Prien in the Chiemgau (Bavaria), which was founded in September 2002 by six schoolchildren and the economics teacher Christian Gelleri. The association was named Chiemgauer Regional - Verein für nachhaltiges Wirtschaften (regional association for sustainable business). The idea was to exchange Euros into the new currency which could then only be spent locally. On January 1st, 2003, they issued the first 2000 Chiemgauer in notes. Rapid growth began and as early as 2006, the Chiemgauer turnover of all the companies involved exceeded one million. Regular congresses also attracted an international audience, and the Chiemgauer became a model project for other regions. In 2010, the Chiemgauer was involved in the microcredit program of the German government.

The Chiemgauer is a 1:1 euro-covered voucher system with a demurrage (devaluation, also called “circulation impulse”) of originally 8% per year (from 2016 reduced to 6%). It exists in notes of 1, 2, 5, 10, 20 and 50 Chiemgauer, which must be supplemented with toll stamps every six months to regain the full value. The Chiemgauer also exists as an electronic "Regio" on special marked accounts with the attached local banks. The revenues from the ongoing devaluation are distributed to the regional associations (culture, sports, education, etc.) exactly according to the wishes of the consumers and also stimulate the region culturally. In 2014, for example, more than 60,000 euro equivalent of cultural promotion were provided in this way.

Example: Bristol Pound (UK)¹⁴

With a population of 433,000, Bristol is the eighth largest city in Great Britain and is located in the county of the same name in the South West. The Bristol Pound arose from the roots of the English Transition Town movement and is very similar to other transition currencies in Brixton, Stroud, Lewes or Totnes and also close to the Regiogeld in Germany.

After two years of preparation, the Bristol Pound (£ B) was first issued in 2012. In the media from all over the world, the story was covered very positively, especially stressing that the Mayor received his entire salary in Bristol Pounds. From the beginning, there were paper notes and electronic money existing in parallel.

The cash part, marketing and networking are funded by the Bristol Pound CIC (Community Interest Company). This public company operates according to the model of a stakeholder cooperative and gives Bristol Pound account holders a right to co-operate in the development of the company. Notes with a three-year running time of 1, 5, 10, and 20 £ B, designed by local artists, are issued. Bristol

¹³ <http://www.chiemgauer.info/>, accessed 22.11.2016

¹⁴ <http://bristolpound.org/>, accessed 22.11.2016



Pound can be purchased in exchange for £ 1 in a 1:1 ratio. A refund is only possible by electronic £ B with a daily exchange limit.

The electronic currency is operated semi-independently by the Bristol Credit Union. Each user of the electronic Bristol Pound becomes a member of the Credit Union. The "central bank" is responsible for the account management and manages the pound sterling from the cash purchase on a fiduciary account. Payments in Bristol Pound can be made via Internet, via SMS or recently with a new specialized app.

The support of the city allows businesses to pay the local business tax with £ B. In the meantime, it is also possible for all members to pay the municipal council with £ B. The taxpaying ability is of course a crucial argument for the acceptance of the currency because a business has a non evictable use for earned £ B, incentivizing the use of the currency in classical economy and not only for private to private exchanges.

3.5 Incentive-Currencies (C)

Description of Class

The concept of “incentive”-currencies is based on the idea that through rewards people are willing to take action into a certain direction. But for non-commercial and especially voluntary actions a reward in ordinary money could be counterproductive because it shifts the focus towards paid labour and therefore threatens the intrinsic motivation of doing something good. However, often voluntary work for social and cultural activities lags behind its potential because of a lack of resources by the people, or simply because without incentives the efforts are scattered and uncoordinated. A possible solution is to “pay” voluntary efforts with non-commercial money: A community currency to bridge this gap and to focus the efforts. A reward in community currency is more than an acknowledgement of effort or service, but it does not interfere with the commercial sphere if the design of such a currency is well done, meaning if it is restricted to its function as a motivator. Therefore, incentive currencies do not claim to be all-purpose currencies but rather usually limited to certain operations.

Features and Advantages

The incentive idea has to have a clear purpose: “What would we like to have the people do or how we would like them to behave.” As this is a kind of “outsider” question, incentive currencies usually are started by municipal or governmental bodies or larger NGO’s, as a tool to support their long-term social or environmental goals.



Example: Spice Time Credits (UK)¹⁵

The ideas behind the Spice Time Credit currency are rooted in the need to revive communities in ex-mining areas in South Wales (UK). The spice idea grew out of the Wales Institute for Community Currencies (WICC), a partnership project funded by the European Union (EU). When the EU programme ended in 2009, the Spice organization was established to develop and spread the work of WICC. The Spice organization continued to develop programmes that included the voluntary, public and private sector, and started to create a national network of local Time Currencies.

Today Spice is a social enterprise working across the UK. Spice develops its agency time credits systems – a form of currency that uses time as a unit of value – for communities and public and voluntary sector agencies. The system functions as an incentive for rewarding people giving their time and effort for social and community efforts. The issuing organizations offer a whole catalogue of all kinds of activities for volunteers to take part, such as gardening, helping at events, supporting other people, sharing their skills and experience, running neighbourhood groups and feeding back on key issues in their area.

People earn Time Credits for contributing to these activities but the key principle is that time is given in a voluntary way to help others, the environment or wider community. It is also possible to form an own group to solve a local issue or problem and “make your community a better place.” The currency circuit starts when volunteering work for specific projects is rewarded by time credits on an hour-for-hour basis. These credits (hour-bills) can be redeemed at a nationwide (UK) network of corporate partners who accept Time Credits for activities and services they provide. These activities are either sponsored or partly paid by the contributions of the benefiting organizations.

Spice Time Credits are a tool for building stronger communities and co-produced services where people are active and equal participants. Time Credits act as a means for organizations and agencies to encourage more people to get involved in their local community by giving their time. Spice has therefore three main focus groups: individuals, organisations and communities. Individuals get opportunities to learn new skills, gain confidence and raise their aspirations. By their increased participation, they might have better access to peer and community support networks, and feel they have an impact. By spending their earned Time Credits, individuals can try out new activities and improve their health and wellbeing and even be able to get engaged in activities they could not previously afford. Organisations and Communities can use Time Credits to engage with new groups or to encourage more active involvement from service users in the design and delivery of services. Involving users in this way can bring new skills and insight, and shape services so that they better respond to need. Organisations participating in Spice programmes include local authorities, housing providers, schools, health and social care providers and a wide range of community organisations.

¹⁵ <http://www.justaddspice.org>, accessed 23.11.2016



Time Credits are very successful and growing fast. In their 2015 report, they count 19,408 individuals who have earned a Time Credit and Spice has facilitated 761 organisations to be supported by these individuals. On their website, they even advertise that Spice is now “the world’s largest community currency” which might be a question of exact definitions, compared with e.g. the CES.

Example: Torekes (Belgium)¹⁶

An early example of a working incentive currency was established in the city of Ghent in Belgium in the neighbourhood of Rabot-Blaisantvest. The starting point was a survey in 2009 to find out what the residents wanted for themselves concerning their high-rise apartment building neighbourhood. Because many wanted to have access to a piece of land for gardening, the city was ready to prepare a piece of abandoned industrial land for this purpose. This was put together with a new local currency, the Torekes. The rent for a little plot for gardening was set to 150 Torekes. People could earn the currency by getting rewarded for local civic contributions towards their neighbours, the neighbourhood or the environment. The whole program was successfully started up in 2010. The name Torekes comes from the old towers, still a landmark of the district.

People of the neighbourhood can find on a website what can be done for the environment and for the neighbourhood, and get Torekes for it. Examples are:

- Less rubbish in the street;
- A flowery facade;
- More renewable energy or saving energy.

The Torekes are valuable in neighbourhood shops for healthy and sustainable purchases. All shops that accept Torekes are listed on a website. The Toreke is a complementary currency designed to be earned or used in order to fulfil certain goals. Something that would not be possible with conventional currency, i.e. the Euro.

The goals of the Torekes currency are described on its website¹⁷ as follows:

- *As a **micro incentive** for individual acts: ranging from getting a façade garden to switching to renewable electricity. The complementary currency functions as any other incentive, emphasising and rewarding behavioural change. Because the emphasis is on little things, a lot of the local residents can participate, even those who are short of cash and are often excluded from other incentive structures.*
- *As a **volunteers' compensation** for volunteering on public property, organised by community support groups. This can be cleaning up the square, organising the neighbourhood barbecue or*

¹⁶ <http://torekes.be/en>, accessed 12.12.2016

¹⁷ <http://www.torekes.be/en/why>, accessed 12.12.2016



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petanque course and lending a hand with maintenance of and around the community gardens and allotments. A lot of activities in public spaces, from playing a game to barbecuing to or gardening, are impossible unless we also mind the safety and tidiness. Here the complementary currency enables the City of Ghent and the local organisations to approve and even reward these civic contributions.

Torekes than can be used locally, for basic necessities and taking into account health and durability. Torekes can guide people towards local, healthy and environmentally friendly consumption. Vegetable stores, bakeries, bicycle repair shops, DIY stores, second hand stores and fair trade products are all available with Torekes. The Torekes can also be used for public transportation, cinema or stages performances.

The issuer and organizer of the currency is the Community Development Ghent which aims to combat social deprivation, poverty and exclusion. The organisation fights for a society in which people can collectively shape their environment. Together with the residents they build a society that is inclusive, democratic and intercultural.

3.6 Business currencies (D)

Description of Class

Business currencies exist especially in the form of barter-networks already for a long time. Usually barter people see their network of businesses more like a swapping circle and believe in the idea of direct exchange, that only has to be extended a little because of the need of indirect exchange to fit the targeted goods to everybody. Whereas true business currencies start at the point of a network of businesses getting a collective advantage by enhancing their internal trade and controlling their own interest-free ability of crediting themselves.

Features and Advantages

Because business currencies rely on existing and usually prosperous businesses each with its own production capabilities, they have de facto aggregated assets that enable them to be trustworthy and offer useful products and services.

Example: WIR (Switzerland)¹⁸

The *Wirtschaftsring* was founded by 16 members in 1934 as "*WIR Wirtschaftsring-Genossenschaft*" in Zurich. This included entrepreneurs who were denied access to working loans by the banks at that time. The German compensation system (System Dickel/ Herpel, see Herpel 1932) and its implementation in Nordic countries served as a model.

¹⁸ <http://wir.ch>, accessed 23.12.2016



Access to the WIR money was initially open to all. In 1935 the system already counted over 3000 participants. The initial period was very experimental. From 1936 onwards, the WIR was subject to the banking law and provided with a Swiss Federal Banking License. This placed the disputed activity on a legal basis and corresponded to a completely different Swiss policy to the almost simultaneous bans on new monetary approaches in Germany and Austria. However, from then on, the WIR system was included into the conventional banking legislation, which does not support alternative approaches.

In the further alternating but successful history the sales and attendance figures increased and reached a provisional peak between 1993 and 1996 with sales of around 2.5 billion WIR-francs.

From 1998 onwards, the WIR Bank was also able to enter the normal banking business with Swiss francs, and since that time has significantly expanded this area so that it is now considerably larger than the actual WIR part.

On November 1, 2016, the WIR system was relaunched with completely revised and extended functions. This also includes a reflection on the original values, in particular the strengthening of the Swiss economy and solidarity.

WIR is a pure centrally managed book money, which is initially mainly used by booking orders, later on a banking application on the PC and now more and more frequently via the special app WIR Pay on smartphones. For the same purchase, two currencies (CHF and CHW) can be booked simultaneously on different accounts at the same time, an outstanding achievement. An own platform WIR Market offers all members a comprehensive shop solution for the presentation of their offer and for their purchases. The vendor has to set a guaranteed minimum rate of WIR money on all his prices. This starts at 3%, but can also be set to 100%. A rate of 30% for example, means that a customer can settle a purchase price of, 100.- with 30.- CHW and 70.- CHF.

There are 13 independent regional groups (associations), the WIR Network, where the connections are maintained and regular events and meetings are held. A large annual WIR fair in Zurich also brings together suppliers and customers personally.

Example: Sardex (Italy)¹⁹

Sardinia has long been a marginal economic zone in Italy with a population of 1.6 million inhabitants and high unemployment. Statistical per capita income is only around 17700 € (2013), which is 30% lower than the Italian average and is also falling steadily. The financial crisis in 2008 hit the region particularly hard. A group of four young, committed residents of the city of Serramanna developed a common vision of how to help their region economically. A specific currency should stop the ongoing shortage of loans and the outflow of euros from the island to the mainland. The model of the Swiss WIR system was the inspiration.

¹⁹ <http://sardex.net>, accessed 22.12.2016



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Sardex was founded at the end of 2009 and started operation in January 2010. The purpose of the network is to connect local companies and offer payment instruments and credit complementary to the traditional euro-currency structures. The availability of the currency creates an additional market opportunity for companies which can make better use of or even expand their business.

Members of Sardex pay a fixed annual contribution according to company size for participation in the system. This also allows all operating costs to be covered. The initial account is zero. Company members get a credit limit and can buy immediately. Employees of the companies can also be a member of Sardex; although they can-not receive a credit, they can spend what they have received on their account. In order to intensify the contacts and to optimize the market, so-called brokers help determine supply and demand and establish the appropriate connections. This is one key factor that contributed to the success, namely the sophisticated and sometimes face to face brokering done by Sardex staff, employed by the Sardex.net SpA company, who have a good overview over the needs and skills of the member-businesses and their owners and staff.

Sardex.net is a new way to rethink the local economy: collaborative and connected by the strength of the network, which creates mutual trust. Within the network companies, a balanced exchange takes place. Value creation remains on the island, and local and sustainable production is preferred.

We will take the Sardex model as the main case for the comparison to the community networks and provide more information in Chapter 4.4.

3.7 Cryptocurrencies (E)

Description of Class

The boosting idea of cryptocurrencies does trigger lots of technically sensitive or IT-rooted people to consider it as “a solution” for “something”. Therefore, we added it into our classification in spite of the fact that it is mainly a technical approach and nearly every class of currency could be also run on blockchain, the main feature of all cryptocurrencies.

Basic ideas of the people who invented Bitcoin as the first of such currencies were approximately:

- Independence of existing institutions (Banks), by distributed and trustworthy accounting approach,
- Anonymity,
- Absolute individualism and independence,
- Replacement of direct human trust by algorithms and computing power,
- Flight from taxes and taxation bureaucracy,
- Higher efficiency of payment systems.



With such ideas, cryptocurrencies like Bitcoin are in a number of key-dimensions an opposite to community currencies, which are designed to foster human relations, direct trust, cooperation, democracy and the common good.

Features and Advantages

Cryptocurrencies of the original Bitcoin-type have the following specifics:

1. Money is created as a reward for putting computing power into the system (so called mining). So money creation is linked with the operation and maintenance of the system itself;
2. There is a fixed final sum of currency, which cannot be overtaken. The link to the economy is therefore, that economy has to adapt to this limit of money-scarcity, with result that the money is superior to the economy;
3. There is no idea of how or whether to remove money from the system after it has completed its work. E.g. Bitcoins, like gold, enjoy a permanent existence;
4. The idea of the transaction system is a cryptic and unchangeable blockchain, in fact a simple ledger (or journal) of all transactions ever done. Additionally, there is a specific booking (negotiation) process how a subsequent transaction can enter the blockchain.

A local or community currency is usually intended to establish a meaningful link between community and economy (or social circumstances) and therefore the responsible people are aware of systemic effects. Most “cryptocurrencies” simply don’t care about that. The model of Bitcoin does more or less the contrary: By eliminating human trust, the economic circumstances have to yield the currency. The impact on society or the costs for environment (e.g., by the use of enormous energy consuming computing capacities) are not considered by design.

The second important criticism is that the transaction system, which is very cleverly designed, takes the difficult role to “maintain mistrust”, i.e. to deal with a network of complete foreigners. A thoughtful analysis of that topic was made by Scott who distinguishes between multi-faceted sides of trust (Scott, p.13f.). These elements influences also strongly the efficiency: Compared to a simple encrypted database hosted on one server in a trusted environment, the existing blockchain needs way more data traffic and computing capacity and therefore is in some dimensions less efficient; however, because there are thousands of computers working on it, this sheer mass has made this technology quite easy adaptable and endangers simpler and more straightforward technology to become outpaced.

Example: Bitcoin (Worldwide)²⁰

The development of Bitcoin is the story of a completely new idea, as far as payment and money are concerned. The starting point is the use of information technology, which is supposed to guarantee a

²⁰ <https://bitcoin.org/en/> (basic information sponsored by the bitcoin foundation), accessed 23.11.2016



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secure transfer of payments in a currency. A peer-to-peer technology was published under the name of Satoshi Nakamoto in 2008, an anonymous person, probably an encryption expert or, at most, a group of people. This consists of a log with an ever-longer blockchain of encrypted information, which contains all data on the electronic payments carried out. In January 2009, an executable program was made available for download.

Initially, bitcoins were used as programming games among game freaks, e.g., a pizza for 10000 BTC could be ordered. Soon, however, it became more serious and in 2011, WikiLeaks (Julian Assange), then cut off from all sources of money, collected donations. But also drug traffickers and wagons discovered the currency and a short time later the value rose to \$22 per BTC. When speculators entered the market in 2013, the price reached over \$1100 in the meantime, but then declined rapidly and was around \$400 per BTC at the end of 2015, raising again to \$900 in December 2016.

Bitcoins only work in a running network of many powerful computers. These are constantly in communication with each other via the Internet. They are called miners because they are speculating on getting newly created bitcoins as rewards to keep their computers running, which is necessary of keeping track of all transactions ever made in a secure way. An identical copy of the current blockchain is available on each machine. If payments are made, the data is collected, reconciled among all participating computers, and then added to the data record as a new block. Thus, the payments are then saved "for all time" in the blockchain view bar. This process takes place approximately every 6-7 minutes. This is how long it takes until a payment is confirmed and it then no longer can be reversed.

Thus, while all payments can be viewed, the sender and recipient remain secret in that each person can open accounts without revealing its identity. Only the reference number is visible. However, as soon as an assignment of the number to a person becomes possible, all payments made by and to the person are also assignable. For this reason, some people recommend to open a new account for each transaction so that no conclusions can be drawn. A wallet is a simple application (or app) that allows someone to open and manage accounts on its computer or mobile device.

Bitcoins can be purchased either on the appropriate money changer-sites online or at special local bitcoin machines. The direct way is to offer services or products against Bitcoins and earn the currency directly.

Example: Freecoin (Pilot)²¹

The idea of blockchain has inspired many different players from grassroots to big banks to develop their own "better" blockchain technology. An approach to find a more participatory and open way was done in the EU-FP7 programme D-CENT (Decentralized Citizens ENgagement Technologies). The newly developed open source toolchain "Freecoin" is somehow complementary to the Bitcoin

²¹ <http://freecoin.ch> and <http://dcentproject.eu>



blockchain. The cryptographic key for the wallets was split into three parts (bitcoin two), allowing a third instance, the issuing democratic organization to enter the wallet and know about the identity of the owner.

Freecoin is at the moment a set of tools (Complementary currency toolkit) that can be taken to let organisations run transparent and auditable reward schemes. It is made for participatory and democratic organisations who want to incentivise participation, unlike centralised banking databases. The aim of Freecoin is to leverage the use of social digital currencies in a reliable, simple and resilient way.

Freecoin is a web application that can be used stand-alone or integrated into systems. The application facilitates value circulation and identity management, supporting multi-signature authentication and off-line transactions on top of multiple blockchain-backends.

The motivations behind Freecoin's design choices are detailed in a special Digital Social Currency Design document, available at the D-CENT or NESTA website²². The main use case for Freecoin are complementary currency systems and credit circuits (C3), but it can well be used as a self-hosted wallet to manage multiple blockchain-based accounts. It has been tested in different community pilots in Europe (Barcelona, Helsinki, Reykjavik and Madrid).

Freecoin is free and open source software (Affero GNU General Public License v3+) written in Clojure to offer a RESTful API and a clean user interface with attention to improve the developer experience and facilitate its adoption by front-end software applications. Freecoin software development was done by the Dyne.org and Thoughtworks Inc. as a part of the D-CENT project.

3.8 Commons-based currencies (F)

Description of Class

This last class of community currencies we discuss is especially important because its basic concept includes the idea of a commons as the foundation of a currency.

Because every currency has to be based on a group of people, there is by definition no private property currency, which nobody else can use, because units have to be handed over to someone sooner or later, for it to be a currency.

A currency itself can therefore be taken as a common pool resource and be conceived like a network through which participants can compare, exchange or store economic values. The goods available under that currency and their valuation are also part of the commons in the same way that a Community Network as a commons is not just a passive set of routers and links, but the available connectivity and the state of the network configuration, as well as the information exchanged. The

²² http://www.nesta.org.uk/sites/default/files/design_of_social_digital_currency.pdf, accessed 23.11.2016



stability of the network is based on trust which is another common resource deeply connected with the participating humans.

Commons based currencies rely on the principles of the commons (Ostrom, 2009) and self-help. In the case of a currency the first and main commons is the network of people using it, bearing it and committing themselves to (economic) collaboration. Therefore, a commons based currency has to be basically a membership organization and fits in very well (but does not need to be limited to) with the cooperative model, which is described e.g., as:

“A cooperative is a corporate entity consisting of an unlimited number of persons (or commercial enterprises) who join together for the primary purpose of promoting or safeguarding the specific economic interests of the society's members by way of collective self-help.” (The Swiss law, Code of Obligations OR, Abt.29 /Art.828²³)

Features and Advantages

Common based currencies have the following additional characteristics:

- They are based on some kind of (vital) common economic interests of members,
- They use collective self-help as central driver,
- They are democratically organized,
- They use the currency as a means to manage the commons and regulate contributions of labour and distribution of wealth among the members.

Example: District Currency (novel design subject to implementation)²⁴

The District Currency is a model of a new type of community currency especially designed for housing cooperatives or cooperatives in general. The model aims to help cooperatives to boost their internal economy and help surrounding districts to develop economically. It might also be useful for neighbourhood groups and networks of various types.

The idea of cooperatives promotes democratic principles and is based on the pooling of the cooperative attitude of the people involved. These include a strong commitment to achieve common goals, which can be difficult or impossible to achieve as an individual. In the particular shape of the building, residential or housing cooperative the goal is "creating affordable housing space and the integration in a socially and culturally functional living environment ..." (Elsen, 2007: pp 283ff.). In this case, an affordable rent might be achieved by "self-help", i.e. substitution of paid work through the direct participation of cooperative members in the construction, operation and maintenance of buildings, real estate and social space, as well as in the administrative work of the cooperative.

²³ <https://www.admin.ch/opc/en/classified-compilation/19110009/201607010000/220.pdf>, accessed 23.11.2016

²⁴ <http://flexonomix.org/en/district-currency-game/>, accessed 23.11.2016



To drive and reward this participation a suitable complementary currency especially for housing cooperatives was researched in a first study. The aim was a specific community currency for a new building project at Hunzikerareal of the cooperative *mehr als wohnen* (translated as “more than housing”) in Zurich. This was a new settlement in a little remote area of Zurich, with 13 buildings and more than 400 apartments, businesses in the ground floor and other necessary infrastructure such as kindergarten, etc. The currency that fitted best in this situation and was suggested to the cooperative was given the name *Quartierwährung* (German for District Currency) (see Martignoni et. al. 2013). For different reasons the currency was not implemented initially at the opening of the new settlement, but is still under consideration. The basic concept was since then refined and developed by using simulation methods and gaming. Figure 1 depicts the process of creation and use of a district currency.

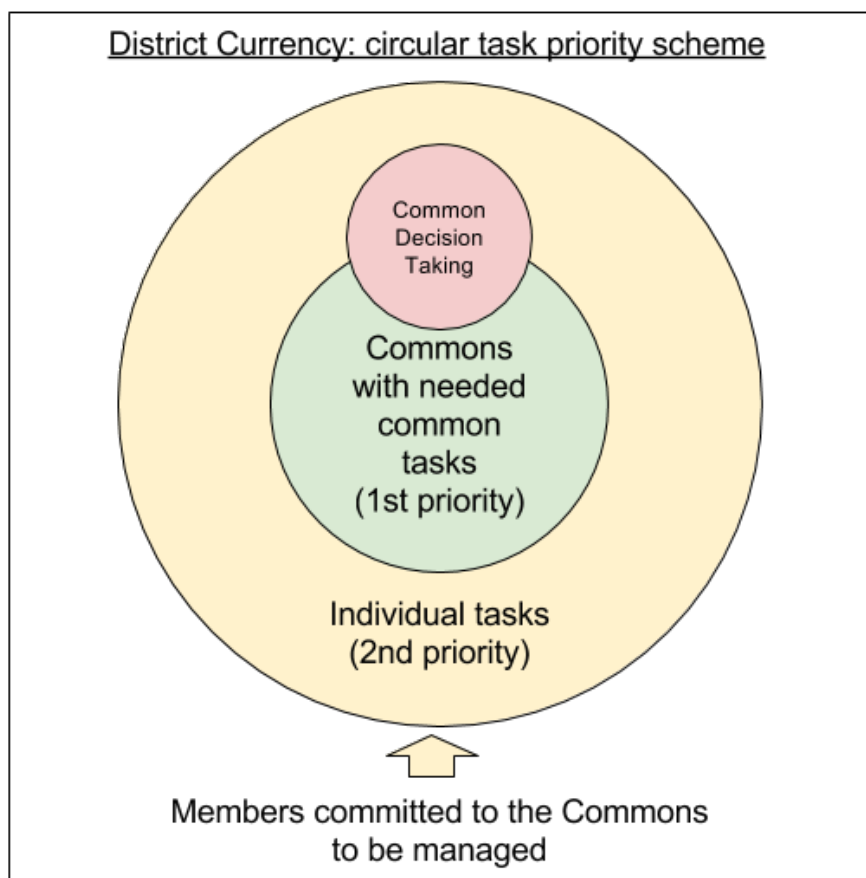


Figure 1: Circular task priority scheme of the district currency: The common tasks are the main drivers of the internal economy (illustration by authors).

The money creation of the district currency is done centrally by the cooperative in the form of fees or recognitions for community services and the needed common tasks democratically selected. The currency is spent to fill this tasks and then, in a second step, can be used for other purposes and capitalize the talents and skills of its members either. After specified periods, a part of the currency in the form of taxes or part of the rent is returned to the cooperative. Thus, a constant and



controllable circulation of currency arises, which also has the potential to replace a (limited) portion of the revenues in local currency (e.g., Euro or Swiss Francs).

The district currency remains in discussion in new Zurich housing cooperatives. A planning game (Flexonomix® District Currency Game) has been created to show the effects and features of such a currency in action. It has been played in the above mentioned housing cooperative *mehr als wohnen* recently, where an internal working group of the cooperative tries to establish an internal currency (see Section 5.3 for further details).

3.9 Implementation and Operation of Community Currencies

All above examples describe successful implementations of the different types of CCs that we have identified. But it is not easy to establish such a successful scheme, nor to run it sustainably over a longer period of time. Many failures have been reported as well, and so it is very important to have enough resources, a careful project planning and some dedicated and educated people working on it.

The scaling or the number of users and transactions are of course also crucial for any currency to become stable and sustainable. Usually this depends on the type of currency and its goals. A time-bank can be very successful and stable with 200 active members, whereas a regional currency needs maybe around 200 businesses and 1000 users to be stable on a low level. Therefore, the necessary scaling of a new type of community network currency is not easy to predict, especially because there are no existing examples of such models yet.



4 Attempting a bold analogy between CNs and CCs

In the following we provide a short introduction to the two models subject to the six key characteristics identified in Section 4.1 and then analyze important similarities and differences that need to be taken into account during a possible integration, discussed at the end of this section. We report here information that are obvious for those involved in netCommons, and may in any case look simple and naive for anyone involved in a CN, or simply by anyone who reads this deliverable well aware of the work of our project. The reason for this simple and somehow repetitive introduction is to make the document self-contained and fully accessible also to readers not involved in CNs, but maybe experts of CCs.

4.1 Community networks

Community networks are communication networks built by citizens and organisations who pool their resources and coordinate their efforts to develop a local networking infrastructure (see Baig et al., 2015). The infrastructure is built in collaboration by individuals who, typically, install some kind of network equipment at home or at a participant organization. They deploy an antenna on their roof, or a cable or optic fiber, and connect with others in an urban or rural area over short or long distances. The resulting network infrastructure can then be used for internal communication between those who have access to the network or for delivering local content, such as live video, or providing services, such as symmetric access to the global Internet. This is possible when an “Internet source”, an Internet gateway, is made available in the network infrastructure.

Deliverable 1.2 describes in detail the different types of CNs and their characteristics. The goal in this section is to repeat this information but present it in a different way that will allow for an easier comparison with Community Currencies (see Sections 4.3-4.5).

Common resource

The collection of antennas, cables, hardware (i.e., routers, storage), and related services, sometimes including Internet connectivity (if any) form an infrastructure that could be owned and/or managed in common by those that have contributed individual resources. In this case, unlike traditional ISPs, the ownership and management of the infrastructure is collective and cooperative: distributed amongst the members of the community and is in essence a “commons”.

In general there are three types of resources: first, the individual or peer-contributed such as routers in a small mesh or individual content servers that can self-organize in a purely decentralized manner; second, the group or local resources to be crowdfunded, contributed and managed by a regional group such as local backbone capacity and maintenance or local services (e.g., telephony, conferencing, media, Internet); and third global resources to be contributed and managed by the community at large (e.g., node database, public web site, Internet interconnection, traffic exchange). While the first is typically based on contributing your own device and individual voluntary self-



motivation, the remaining types of resources rely on coordination mechanisms that require more abstract contributions to aggregate money and effort to crowdfund these resources.

Community building

Community networks are typically constructed either out of social or economic need (in most cases due to limited or no access to the Internet) or out of political reasons related to sovereignty, independence, network neutrality, affordable Internet access for all, and more. Being fully inclusive to its community, the fundamental principles revolve around

- i) the openness of access to the infrastructure (usage), and
- ii) the openness of participation (construction, operation, governance) in the development of the infrastructure and its community.

But there are often misunderstandings since the word “community” could have a different meaning depending on the situation. On the one hand, a “community” could refer to a community of like-minded people connected through an “overlay” network in a big city, or it could refer to the wider community of people enjoying the services of a local network, as for example a rural village, maybe reduced to sharing only their technical or other special interest. Antoniadis (2016) analyzes in detail the differences between these two interpretations of the term community in “community networks”, which together with the two basic services offered (local vs. Internet access) form a two-dimensional matrix²⁵, which could be used to characterize a specific community network.

Managing the commons

One of the key challenges of community networks and in general peer-to-peer systems is the fair sharing of the available resources and the existence of the appropriate incentives for participation and investments required to sustain the infrastructure and services. In the case of “locally-driven” communities this may not be a big issue since most participants have strong motivations for participation and there is a significant level of contributions without the need of incentives, as additional common costs such servers, backbone, maintenance are negligible and can be easily assumed by some members.

However, when Internet connectivity is one of the main services offered there are non-negligible shared costs that need to be taken into consideration. In this case, there are different approaches as described above. On the one extreme, there is the “free Internet for all” approach of highly decentralized systems like Freifunk and WLAN Slovenja, which depend mostly on voluntary contributions of their members to offer Internet connectivity to all that have access to the network, without exceptions. On the other extreme, there are more traditional approaches like the French network FFDN, which operates as a network of “ethical” ISPs that offer connectivity of better quality and at lower prices compared to commercial ISPs.

²⁵ Matrix with x-axis: Introvert-Extrovert; y-axis: Local Services – Internet Access, see example at <http://firstmonday.org/ojs/index.php/fm/article/viewFile/7123/5661/50212>, accessed 26.12.2016



In between these two extremes, Guifi.net has developed a unique model in which the network infrastructure is treated separated from the services on top of it and a sophisticated compensation scheme is being implemented to create a balance between those that offer voluntary and commercial services (Baig et al., 2016).

Boundaries and complementarity

The fundamental principles of open and non-discriminatory access, and open participation in the life of the network are accommodated into instruments such as the community license, the management tools, the specific collaboration agreements with professionals and third parties, which prevent exclusion and regulate open and fair usage of the resource. These instruments clearly define the boundaries, and the bundle of rights (Schlager and Ostrom, 2015).

When discussing the design and deployment of local services offered by a community network a very challenging question arises: What does local actually mean? What are the borders inside which a local service is made available? And how is it related to the complementary Internet services?

If, for example, local connectivity in a community network is used to collect local environmental sensor data or two citizens have a video call inside the network, that's clearly local. However, when a community network offers a social networking service for its members, to what extent the interactions taking place "inside" the network are visible to the outside world and, vice versa, to what extent information available online is accessible through the local network? For cases when Internet connectivity is not available, for various reasons, the answer is easy. But for more complex situations, when Internet connectivity is available and/or the network spreads between "natural" borders (such as a certain district or even city) specific decisions need to be taken and supported by the software platform installed on the local network.

Today, most community networks advocate for the development and hosting of local services inside the community network. That provides very cost-effective service hosting facilities (community data centres) allowing dual sided services that can be reached from inside the community network (an intranet) or from the Internet (using a single or double local and global IP address). In practice, it does not prove always easy to engage people, especially outsiders, to participate in these local services.

Growth model

There are different ways to see the concept of "growth". A specific network under a certain administration, growing bigger and bigger, scaling up with more and more nodes connected, as it includes more users (higher density) in the same area, or more space (wider coverage). Or a specific set of technology, rules, and branding, in other words a certain "model" being replicated in different places, as part of a single federation (under a single governance) or as a new disjoint community. When these two forms of growth are combined, it is not always easy to identify the borders of a single "autonomous system".



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However, we can always assess the growth of a certain network by considering two important characteristics: how easy it is for a new participant to join the network (for scaling up) and how easy it is to create a new network of the same type from scratch (for replication or federation).

Note also that scaling is usually non-linear: e.g., in infrastructure mode, a supernode (not trivial to install) can allocate tens of end-user nodes (relatively easy to install); similar is for the adhoc mode: mesh clouds at some point saturate, going beyond this point is not easy.

As community networks grow and become a significant or even a critical infrastructure for local or regional connectivity, they also make the transition from experimentation to sustainable important or even critical infrastructures. That brings specialization, professionalization, institutionalization, and therefore strong service, regulatory, competition and governmental pressure.

Computer-support tools

There are different types of shared tools required to operate a community network. They range from shared knowledge (catalogs, documentation, best practices), shared artifacts (hardware developments like LibreRouter, software distributions, coordination services like node databases) that can be used to develop and implement specific community procedures.

More specifically, communities have knowledge repositories for sharing useful information and experience across a given community. This shared knowledge promotes collective efficiencies, saving time to participants and reducing the complexity of the collective effort (e.g., what hardware, software, installations are known to work well, what are the best practices, and so on).

Second, communities share artifacts such as hardware devices, antennas, cables and routers that can be built, bought or modified to build the network fabric; certain routing solutions require the replacement of the proprietary software of routers (also called “flashing”) with free software. This, among other benefits, offers advanced security solutions, which are transparent and continuously maintained by a global community of programmers, and tailored by local teams. It also provides the means to keep operational devices that are no longer supported by their manufacturers with positive economic and ecological impact, and most importantly it protects consumers from lock-in and non-transparent policies by big corporations. E.g., the qmp.cat firmware²⁶ in mesh areas of Guifi.net, or the Freifunk Firmware, or Libremesh, a recent effort to unify the different solutions developed in different community wireless networks. There are several events that gather practitioners to share their experience. In particular, *the battle of the mesh* gathers people from across the world to test the performance of different routing protocols for ad-hoc networks²⁷.

There are also different management tools being developed by the community which are in general very advanced. Examples are node databases, monitoring systems, address allocation services, crowdfunding tools, decision-support systems. These allow the implementation of specific

²⁶ see Quick Mesh Project, <http://qmp.cat>, accessed 26.12.2016

²⁷ see <http://battlemesh.org>, accessed 23.11.2016



community procedures in a cost-effective manner that facilitate the governance of the community and the quick resolution of conflicts, without imposing a big additional burden on specific participants.

Finally, there is a wide variety of FLOSS software applications that can be easily hosted on one's own server (self-hosted) and which could be in principle used for providing local services and a more "intimate" digital space for the members of a community network, but also people living in proximity. Until recently there were not many such easily customizable applications of high quality and usability comparable with commercial products, with only a few exceptions as for example *Wordpress*. Today more and more applications reach a state of maturity, like *Etherpad*, *Owncloud*, *Limesurvey*, and more. Containers like *Docker* and *Cloudy* make it also very easy to "self-host" them.

4.2 Community currencies

Common resource

A currency itself can be taken as a common pool resource²⁸ and be conceived like a network through which participants can compare, exchange or store economic values. The goods available under that currency and their valuation are also part of the commons in the same way that a Community Network as a commons is not just a passive set of routers and links, but the available connectivity and the state of the network configuration. The stability of the currency-network is based on trust which is another common resource deeply connected with the inside of the participating humans.

Typically, community currencies are organized as legal entities (e.g. associations or cooperatives). Many currencies run on centralized ICT infrastructures and platforms like Cyclos, CES, etc. In some cases, paper notes are used alone or alongside with electronic money. However, the costs associated to the maintenance of this infrastructure have to be covered. This is done through voluntary work, membership fees, demurrage fees or in case of professional currencies by transaction costs or a taxing system. The currency survives as long as its operational costs are covered, it is well operated by the management and is regularly and along its principles used by the members of the community.

Community building

Similarly to community networks, most complementary currencies are built and maintained by groups of like-minded people. This core group has to promote the currency, motivate participants

²⁸ A good explanation is given by Barnes (2014, p.1): "From one particular point of view – that of money as private property – the idea that money could be treated as a Common Pool Resource (CPR) seems patently absurd. [...] But going forward money is either a reward for past work, or (when issued through the device of credit) an advance secured in expectation of future work. From this viewpoint we can see money as an aspirational commons – a Common Pool Resource backed by our collective efforts, that with the right governance regime could be managed equitably and to mutual benefit."



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and foster engagement. Time-exchange or LETS-groups for example gather in regular meetings to facilitate the exchange of services and goods. Larger systems organize market events or even big regional fairs as the WIR-Messe. Online marketplaces and forums or discussion groups are also essential for most currencies.

While the transactions effectively realized are most important for the majority of all community currencies, a support by brokering could be crucial but is not often used. US or British time banks use professional brokers, while Sardex.net and its offspring in Italy are very successful by following such a strategy.

Another approach is used by the German Chiemgauer Regiogeld as mentioned before: They introduce all sorts of local cultural and sports clubs by sponsoring them through exchange and demurrage fees. The members of Chiemgauer decide by declaration, which of these clubs should get their turnaround-benefit. This system enforces local culture and strengthens the community.

Managing the commons

In addition to the basic accounting functionality that is inherent in every currency, sustainable community currencies need to take measures against failures. In many systems members that fail to pay back their negative credit could be difficult to be handled because the legal situation is often only based on weak membership agreements. But also the opposite, members that have too much positive credit and do not spend it, and therefore blocking the flow, might become serious obstacles. Another important point is the guard of the boundaries as mentioned later. E.g., in a non-convertible currency like WIR it is forbidden to exchange WIR-francs into Swiss francs, but still some businesses like to do that so the management has to take measures to punish such rule breakers (in extremis by exclusion).

An important decision-making process to this end, and especially when there is no exchange between the local and the national currency are the “credit lines” offered to different members of a community currency. This is a very complex risk assessment process that requires intuition and good knowledge of the community on behalf of the currency managers and a high-level of trust by the community toward the management.

Boundaries and complementarity

Another very important decision to be taken while designing a complementary currency is whether and how local currency can be exchanged to the predominant national currency. In other words, how the boundaries of the currency are defined and managed. Schroeder recognized this feature as crucial and links the extent to which a new currency is competing or complementing national currency to the long-term success of that currency in being socially just (see Schroeder, 2016). Blanc distinguishes four dimensions: commensurability, convertibility, co-use, coincidence to determine the relation between different currencies (see Blanc, 2009, p.6ff.). Currency design and



rule setting can determine these features and the resulting boundaries but these will be also influenced by the also the actual use of the currency.

For example, allowing the seamless exchange of a community currency to the national one facilitates the participation of people since there is no fear for lost income in case the local currency is abandoned. However, this can reduce significantly the impact of the currency in the local economy and the overall economic behaviour that it promotes. For this, many schemes implement a “penalty” for such an exchange while others do not allow it at all. The compliance with the national tax regulations is also a very crucial aspect since it is necessary for a community currency to adapt to the existing legal framework especially if it likes to extend its reach to traditional markets and increase its scale, like WIR and Sardex.

Growth model

Most complementary currencies fail to scale more than a few hundred active members and therefore rarely manage to engage a wider part of the local economic actors. There are some exceptions however, like the Swiss WIR with around 45,000 business-members representing around 8% of all Swiss SME’s. For social purposes a small number of participants might be sufficient to sustain a small-scale currency scheme but for the economical part lack of adequate scale is a main reason for failure. Without a sufficient amount of transactions, a currency becomes literally useless and therefore people will reject it or step out.

One possible way out of the to-small-to-succeed-trap is the nesting of small currencies in networks of intertrade and interchange (see Martignoni, 2015). One such successful example is the above described CES which allows and supports trade between different member currencies using conversion rates and an integrated clearing center.

Another way to address the problem of scale is to build tools and knowledge for supporting the creation of new systems. Then growing up to a sustainable size and replicating a successful to other regions is another possible strategy, the one followed successfully by Sardex.net (Littera et al., 2016). Then interconnecting the different regions running compatible currency systems would depend on the specificities of the environment and the potential balance between the different economic activities in the different regions.

Computer-support tools

To operate a community currency a special software is used in most cases. There are many proprietary solutions but also some open source developments which are successful. One main product is Cyclos a universal solution developed by the STRO foundation in the Netherlands which in the meantime has developed also a “closed” source banking system-branch with the option of a “social license” for non-profit organizations and small scale projects. Another solution, Hamlet, is developed by Community Forge Association Geneva, and is mostly used by time banks and LETS.



The above mentioned CES does have an own proprietary software framework closely related to the “Community Forge” solution.

In recent times, more and more approaches are considering to build community currencies based on blockchain technology (cryptocurrencies). However, as described in detail above, Bitcoin-like currencies do not fulfill commoning needs and community building. They are rather designed to replace the critical trust-building process through social and other interactions with cryptographic algorithms and machine-intelligence. But there are efforts to overcome these limits and design special social digital currency like Freecoin or Faircoin²⁹.

4.3 Similarities and differences

Having briefly presented the main characteristics of our two different forms of community action, we attempt a few analogies that might help to understand better the following comparison of our concrete case studies. We do this being aware of the important differences between currencies and communication networks and the fact that they signify different concepts, very complicated on their own terms. But we expect that it will prove inspiring to think of an economy as a network for transferring goods and services for which the currency and the corresponding rules is analogous to a networking protocol and where a bank account (and its unique and user bind number) is analogous to an IP address.

What is interesting in this stressed analogy is the role of the nodes in the economy network. What would be an appropriate analogy in this case? The Internet is famous for being built as a “dumb network” (dummy core) pushing all the intelligence at the edges and staying itself a neutral means for transferring data from point A to point B. In this sense the network is a black box similar to the network of banks responsible to transfer money from account A to account B. But while a communication network transports also the content itself, the currency network transfers only the countervalue of the content and the “content” is transferred outside the network, separately (e.g. by direct handover, by logistics or by transfer of legal items) and then both have to be synchronized by some measures like receipts or signatures.

In the currency domain, there are many misunderstandings between the socio-technical institution with logical and mathematical consistency with fixed rules and the manifestation of value which is fluctuating, deeply personal and illogical sometimes. Therefore, the idea of separating the accounting side of money (or a currency) from the value side as proposed by Martignoni (2016, p.437) could provide an interesting analogy with the layered structure of communication networks that separate the different communication layers (physical, network, services). Then this distinction between a “mechanical” counting side, where the mathematics of accounting are applicable, and a value side, where the kind and nature of the content is mirrored and transferred, could help compare better currencies and networks as an infrastructural phenomenon.

²⁹ <https://fair-coin.org>, accessed 23.11.2016



One of the main functions of both the Internet and the economy is the “discovery” of services and content. In the Internet there are also two different ways to discover a certain “node”. At the low level based on its address (the IP address) using the border gateway protocol that allows the different “autonomous systems” (something like the different banks) to forward packets to their destination without requiring a central authority to keep a detailed list of all addresses. At the content level, search engines like Google and social networks like Facebook facilitate the matching of producers and consumers of information. In the economy, market mechanisms facilitate the matching of needs and offers, which is increasingly done through the Internet. At a lower level, an economic transaction needs to be recorded, and a different “network” is needed to mediate between the different entities responsible for the accounts of the two parties. And indeed today such interactions take place also on top of the Internet.

A key concern in both domains is that as the system grows the more its internal workings become complex and invisible. The main novelty of community networks compared to the commercial ISP services is that the nodes of the network belong to its users and they do not form a “black box” managed by powerful companies, both in terms of technical functionality and governance. When there is additional “professional” infrastructure required, e.g., an access network in public spaces or fiber cables, this is also owned by individuals and/or local institutions, e.g., municipalities, non-profit organizations, etc.

The bitcoin and the blockchain technology is an example of an effort to do something similar in the domain of currencies at a global level. At the local level, community currencies are typically centralized systems from a technological point of view at least. That is, there is a single server storing all interactions, again when cash is not used. However, despite the centralization of the ICT infrastructure, all the members of the network need to install their own “node” in the system. This node needs to be equipped with all required infrastructure to exchange goods using a local currency (special receipts, card readers, etc.) and advertise this information (e.g., with the “we accept local currency” sticker on the store window).

Another important similarity between CNs and CCs is the critical role that trust plays in both domains of local action. Indeed, trust is one of the most important investments required to build the “nodes” of a local currency. First, all members of a community currency network need to fully trust those that run the underlying accounting infrastructure and/or the printing process. In addition to the integrity of the accounting information the management team needs to take complex decisions in relation to credit lines, and other thresholds required to guarantee a balanced economy. But most importantly, everyone needs to trust the currency itself and its future survival. For this, the exchangeability with national/fiat currency plays a key role.

When local currency is not exchangeable with fiat currency, the failure of the system is translated to loss of income. However, allowing for such exchanges reduces significantly the impact of the community currency in the local economy. On the other hand, the threat of failure of fiat currencies, which recently became more likely due to the unsolved monetary problems and the big amounts of



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currencies distributed by quantitative easing of central banks, might reveal the important role of non-exchangeable community currencies as an insurance and therefore increase trust.

In community networks trust plays also a very central role. First, there is the issue of integrity of the infrastructure in terms of net neutrality and privacy. Second, there is the long-term perspective and the expectations of the future sustainability of the network. However, the more such commons-bases systems grow the more it becomes possible for all actors to take advantage of the success of the network and its effects, both insiders and outsiders seeking for transforming a successful achievement of the community to profitable business. So, for the system to reach a critical mass of participants the management team needs to be trusted from the very beginning that will do their best to preserve the main principles.

The following table provides a brief high-level mapping of key characteristics of community networks and community currencies as collaborative commoning³⁰ activities:

³⁰ A verb to describe the social practices used by commoners in the course of managing shared resources and reclaiming the commons. Popularized by historian Peter Linebaugh (see <https://wiki.p2pfoundation.net/Commoning>, accessed 13.12.2016)



Characteristics	Community networks	Community currencies
The “common” resource (characteristics, properties)	<i>Contributed:</i> resource: network routers, links, computers <i>Extractable:</i> resource: connectivity and optional services (partially rival)	<i>Contributed:</i> resource: available assets&services, market infrastructure <i>Extractable:</i> resource: the established “market” and network of trust, the currency itself as infrastructure for exchange.
Community building (bootstrapping, membership, vision)	<i>Membership:</i> Any citizens and organisations in an area; <i>Boostrapping:</i> developing connectivity in an area <i>Vision:</i> infrastructure for connectivity and services for all	<i>Membership:</i> Any citizens and organisations in an area; <i>Boostrapping:</i> building a small but balanced economic circle between trusted entities <i>Vision:</i> Stable and resilient local economy for all, disincentives for accumulation
Managing the commons (participation, accounting, rules, decision-making)	<i>Participation:</i> accept license <i>Design making:</i> choosing of software, hardware-brands, traffic limitations <i>Accounting:</i> How to count and recognize contributions <i>Decision making:</i> consensus Conflict resolution Crowdfunding and compensation	<i>Participation:</i> accept currency <i>Design making:</i> credit limits, membership and transaction fees, transparency; <i>Accounting:</i> centralized accounting system, currency notes; <i>Decision making:</i> various mechanisms
Boundaries and complementarity (interactions with the global system)	<i>Boundaries:</i> defined by community license; <i>Global interactions:</i> voluntary and professional work Local and global interconnection for services (peering, transit providers)	<i>Scope:</i> Eligibility for membership, acceptance of the currency <i>Compatibility:</i> Exchange with fiat currency, tax compliance
Scaling up (distributed vs. centralized architecture)	Federation of small groups, peering, economic compensation, professionalization	Nested structure of federated small groups, bound together by negotiated exchange rules and exchange rates; Replication of successful model; Inclusion of different actors (SMEs, customers, public institutions, etc), professionalization
Computer-support tools (proprietary vs. free software)	Building blocks to reduce complexity (planning nodes and links), Participation (communication) and coordination tools (shared knowledge, node database, accounting)	Accounting and Marketplace tools with integrated management abilities. Communication and extraction of data for economic stirring processes

Table 1: High-level mapping of key characteristics of community networks and community currencies as collaborative commoning activities



4.4 Two success stories: Guifi.net and Sardex.net

Based on the above analysis we describe below in parallel two successful examples of a community network and a community currency respectively and contrast them with other similar systems.

Our selected example of a successful community network is Guifi.net, the already mentioned citizen project in Catalonia with over 30.000 nodes branded as “a network infrastructure as commons”, on top of which a wide variety of ISPs can offer Internet connectivity in addition to other local services. In reality, most people use the network for the good Internet services that it provides. One of its most important strength is that Internet connectivity is offered 100% “legally”, while at the same time the core infrastructure is purely managed as a commons. It even received the European Commission’s 2015 European Broadband award on “Innovative models of financing, business and investment”. This might seem like a “small” victory for the community networking “radicals” who often advocate for “free Internet” everywhere for all, on purely distributed and open networks with non-hierarchical governance. Guifi.net has made some compromises to this respect, since it is run by a foundation whose board is responsible for all important decisions regarding the overall governance of the community network, while still allowing the operation of the network to depend on the collaborative effort of the whole community. And Internet connectivity is not always for free, since an Internet connection is considered as any other service offered on top of the network with terms and conditions decided by the corresponding provider.

The Guifi.net license (Network Commons License) establishes the participation framework. It sets the freedoms and boundaries of the commons (Baig, et.al. 2015). Any Guifi.net participant must subscribe to the community license³¹. The compact preamble has four freedoms, comparable to libre software licenses:

1. You have the freedom to use the network for any purpose as long as you don't harm the operation of the network itself, the rights of other users, or the principles of neutrality that allow contents and services to flow without deliberate interference.
2. You have the right to understand the network and its components, and to share knowledge of its mechanisms and principles.
3. You have the right to offer services and content to the network on your own terms.
4. You have the right to join the network, and the obligation to extend this set of rights to anyone according to these same terms.

The Guifi.net license is written to be enforceable under the Spanish legislation. Legal certainty is essential to stimulate participation and investment, which in turn, is at the base of any economic activity. The license has been developed as part of a long-lasting participatory deliberation process

³¹ The FONN license: <http://guifi.net/en/FONNC>, accessed 23.11.2016



over several years, with contributions from many community members, reaching a consensus, revised and approved in several versions by the Foundation's Board.

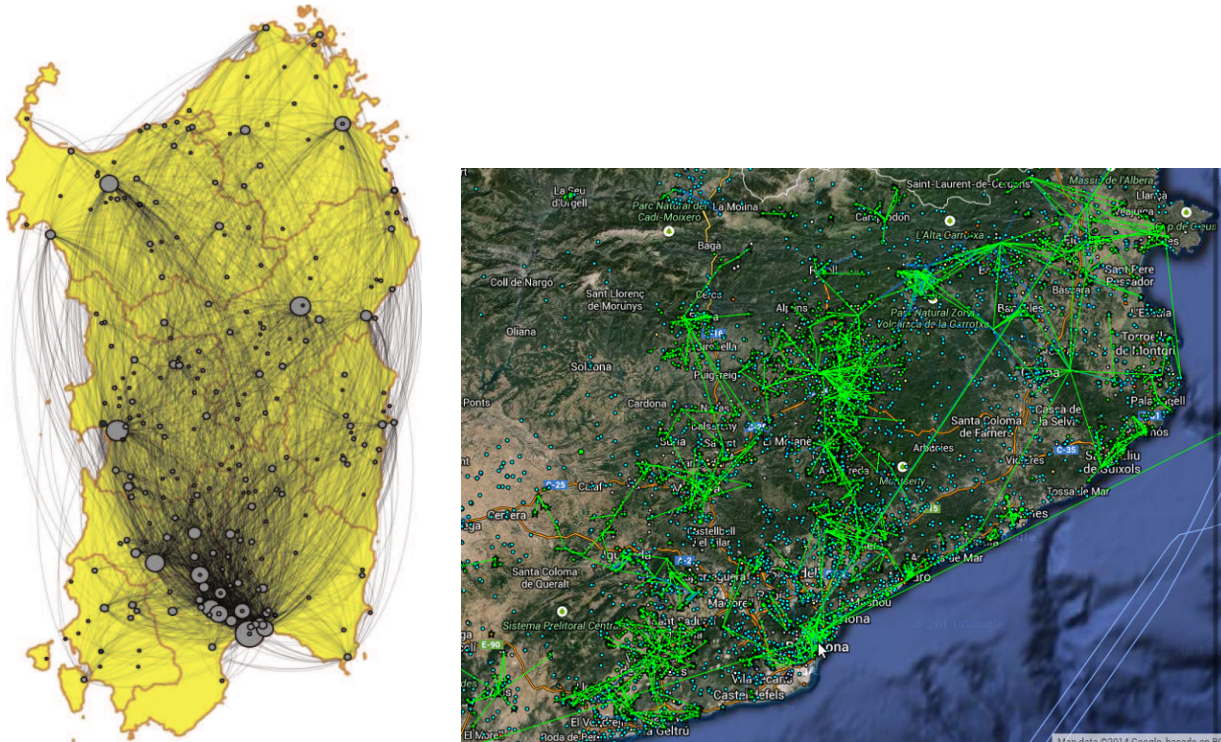


Figure 2: Comparison: Sardex.net with economic transactions between members on the island (reproduced from Iosifides et al. 2015) and Guifi.net, network graph, sector around Barcelona³²

Similarly to guifi.net, Sardex.net is a very successful community or more accurately complementary currency in Sardinia, Italy, founded in 2009 (Littera et al, 2016). Figure 2 depicts two popular graphs of the two networks. The graphs might look similar, but in reality they represent two different communication layers. The Sardex graph corresponds to transactions between members of the network that are limited only by the corresponding demand, while the guifi.net graph corresponds to the communications network, that like Sardex.net, allows interactions between any set of nodes. On the other hand, the network infrastructure itself is limited by the geography and equipment costs, and thus results in a more structured network with “highways” and “low traffic roads”.

Sardex has managed to offer a local currency system that is operated by local actors, offering credit without interest to local businesses, and promoting the local economy while at the same time be compatible with the global economy. That is done by setting one Sardex equal to one Euro but not

³² Graphs reproduced from <http://guifi.net>



letting exchange the two directly but allowing mixed payments, e.g. an article offered at a price of 100€ by a participant might be paid by 50€ plus 50 Sardex by the buyer.

Sardex is in fact a commercial credit circuit which gives a credit-limit to the member businesses according to their estimated abilities to produce (and sell) goods and services. This credit can be used to buy from others and should be repaid by selling to others. Most important here is “the absence of interest on all balances” (Dini & Kioupiolis, p.9). Even if there is no direct exchange between Sardex and Euro, every transaction in Sardex is subject to taxes in Euro, as the business keeper books it like it was an income in Euro. The success of Sardex is impressive: after only six years of existence around 3,000 businesses representing 2% of all enterprises in Sardinia are participating. The turnaround in 2015 was already more than 50 Million Euro. Sardex.net was awarded with several prizes and included the 2013/14 European Business Award.

One key factor that contributed to this success is the sophisticated and sometimes face to face brokering done by Sardex staff, employed by the Sardex.net Ltd company, who have a good overview over the needs and skills of the member-businesses and their owners and staff. Like Guifi.net, Sardex is considered by many community currency activists as a solution that is not revolutionary enough. However, this is exactly the condition that allows both systems to innovate and propose radical but pragmatic solutions for managing the “core” infrastructure of their domain of local action.

For example, Guifi.net tries hard to reduce the dependence of the operation of the network on social cohesion and community building while keeping the opportunities to participate completely open. This is also the case for “professionals” who are very welcome to offer their services on top of the community, subject to the key principles of commoning, and they do play a very prominent role.

It is interesting also how these systems started both in a small village out of pressing need (the lack of Internet connectivity in the case of Guifi.net and the lack of sufficient currency in the market in the case of Sardex.net) and were founded by small teams of highly motivated and familiar people that keep until today the decision-making power, but at the same time being trusted that their actions are toward the common good.

The strong national or more precise, regional identity (Catalunya and Sardinia) is another common characteristic of the environment where these two systems managed to develop further than the majority of their counterparts. Is this the most important requirement for success or perhaps a small extra driving force that could be replaced by clever design choices derived from the lessons learned from these pioneering systems?

4.5 Complementary networks like complementary currencies, and vice versa

Both community networks and complementary currencies are known with different names, sometimes with common for the two cases adjectives, like “community”, “alternative” or “local”,



and sometimes with more specialized terms like “mesh”, “ad-hoc” or “wireless” for the case of networks and “regional”, “sectoral” or “transition” for the case of currencies.

The term “complementary” is a term that is used widely in the case of community currencies pointing to a very important active mechanism of initiatives that allows them to operate “in parallel”, both dependent and independent from the mainstream economy, as discussed above. Such currencies complement the predominant national currency (legal tender) and are able to compensate some of its disadvantages and weaknesses for a better functioning of the local economy. Similarly, community networks are complementary to other forms of development or governance of networking infrastructures, that can produce effective connectivity in dense and wealthy areas, but do not work in less developed and challenged areas. In both cases, complementary arrangements based on inclusive cooperative models and local investments provide alternatives to exclusive competitive models based on extracting profit.

We believe that this functionality implied by the term complementary is very important also for the case of community networks and it is worth to be stressed. But until today it is somehow underestimated, with the exception of Guifi.net, and this is why we chose this for the title of this paper, and not the more widely used term “community networks”: to motivate people to think such networks more as “complementary” to the public Internet rather than either, on the one extreme, as alternatives, or on the other extreme, as simple gateways to the Internet.

So, what could a today’s community network learn from the Sardex.net experience and other complementary currencies? How would a “complementary network” look like?

Perhaps the most important lesson to be learned from systems like Sardex is the combination of compatibility with the “system” (i.e., paying taxes and allowing mixed purchases) while at the same being radical in the design of the “local” currency which operates completely isolated from the national currency (no exchange possible). It is exactly this compatibility with the global “system” that allows for significant innovation and radical approaches for core elements of local infrastructures, like for example the development of appropriate local applications, identity management, etc. at a significant scale.

The other important lesson from Sardex is that a local solution for a critical part of our everyday life (economic activities and communication) shouldn’t be constrained to its core functionality (e.g., running the community currency) but engage in additional educational, cultural, and social activities. For example, Sardex.net operates an online TV channel, ejatv.com and organizes various social and educational events, including the Mitzas annual conference³³, which brings together experts around the world with local stakeholders and citizens.

This is important both because such a grassroots institution with good reputation can engage more people in such activities and, on the other side, the social interactions and knowledge shared during

³³ <http://www.sardex.net/blog/category/eventi/mitzas/>, accessed 23.11.2016



such events are a fundamental requirement for building trust and transforming people from passive consumers and producers to active citizens and emancipated members of a vibrant local economy.

However, all these activities require a lot of time, in addition to the highly demanding management of a complementary currency. This is perhaps the main reason why Guifi.net has experimented but not yet fully developed similar activities until now.

But Guifi.net has also an important lesson to offer as far as complementarity is concerned. Although not used often as an explicit term, Guifi.net advocates in favor of the complementarity of a network infrastructure as a whole, built as a commons, co-existing with other solutions. As Roger Baig stressed in his intervention at a recent workshop in Barcelona³⁴: *“We want to be treated exactly as the other players in the market, not favorably.”*

In other words, Guifi.net offers an alternative that is complementary to the standard de facto way of doing networks, i.e., the traditional Telco's. It does not position itself against them, but claims that the commons-based model is fairer in terms of social justice, and economically more efficient. These are very important ingredients for the economic sustainability of CNs.

Moreover, the separation of the network infrastructure from the provided services is exactly an enabler of complementarity in a sense, a form of “vertical” complementarity, and this is an interesting aspect to be considered also in the case of currencies, as briefly discussed above.

4.6 Guifi.net and the District Currency Game

A unique characteristic of Guifi.net as a community network is the introduction of a concrete notion of a “commons” as an integral part of a compensation system. Guifi.net places the members of the network in three categories based on their commitment to the support of the common infrastructure:

- A) Fully committed with the commons: 100% of business activity created and investments made will be under a commons ecosystem and priority to the commons;
- B) Mixed commitment with the commons: Sometimes doing business with the commons, but also including others with proprietary infrastructures;
- C) Opportunist: Just using the Commons occasionally / for some interest or under request, but while promoting business/investments, will be always on a proprietary network.

As described by Ramon Roca (Cook Network Consultants, 2015): *“While in the past we have crowd sourced funding for necessary repairs to things like wireless supernodes, we are beginning to think that if the professionals want to have a service to sell to people, that perhaps we should try to negotiate with them so they build maintenance and repairs into their pricing structure. They do get a monthly fee from users and they should be willing to invest a part of that into maintaining their parts of the Commons infrastructure. The setup works, but it is not problem free. For example,*

³⁴ Workshop on community networking infrastructures: Efficient collaboration between government, citizens and enterprises, Friday 17th June 2016, Barcelona



one problem was that while we have more than one professional working on solutions in the same area, when something went wrong in that area the one professional expected the other guy to make the repair.”

On the other side, volunteers need also to be compensated for their contributions to the commons. However, as mentioned in D1.2 for the case of Guifi.net, *“volunteers typically feel less legally bound to the project and may disregard or dislike accounting, paperwork, or procedures. Thus, the group must understand that a methodology and some metrics are needed for recognising results and reputation and that there is no way to claim contributions made without accounting for them first.”*

It is easy to see the common characteristics with this aspect of Guifi.net with the commons-based currencies introduced above and more specifically the District Currency game, which tries also to balance professional and voluntary contributions highlighting the importance of the commons and the need to devise specialized mechanisms to manage them efficiently.





5 Discussion and possible future steps

We have attempted a somehow stretched analogy between community currencies and community currencies without really knowing where it could lead and many of the ideas introduced here were produced during this new collaboration, which is still an ongoing learning process for all parties involved (NetHood and UPC/Guifi.net). The main reason that motivated us to engage in such an intellectual experiment is that community networks and community currencies are systems not well understood neither by outsiders, nor by insiders. Even people active in these domains do not always see how Guifi.net or Sardex.net are different from similar initiatives.

But in addition to a mere analogy for educational purposes, bringing closer together experts on community networks with those on community currencies is also a first step toward interesting integrations between the two models.

This idea of combining good ideas in different domains of everyday life has been recently popularized by the French film “Demain” (2015)³⁵ and such voices are being heard both from the grassroots movements and the official institutions. The EU Horizon2020 CAPS framework is one such initiative that tries to bring together researchers and activists around concrete pilot studies and demonstrates the positive role that technology can have in supporting communities. We elaborate below on a few concrete next steps along this direction.

5.1 A community currency for an existing CN like Guifi.net

Would a community currency help for the management of resources shared in a community network and therefore empower the economic sustainability? At a first glance, the two models seem to be able to complement each other very well. The network is somehow difficult to develop beyond its role as a carrier and connector. Through the use of a currency the value side and therefore more “meaning” to use and maintain the network could be developed. The currency on the other side could gain from the pure technical and logical structure of a network to assure its accounting side but also provide a more attractive medium of communication for the local “market”.

Note also that the well-developed compensation scheme of Guifi.net (Baig et al., 2016) shares certain similarities with a mutual credit system and the under development District Currency could be adapted even easier. A possible benefit from introducing a local currency as part of the Guifi.net ecosystem would be to allow non-networking resources to be traded inside the network community. But then it is not obvious how to keep the whole economy “balanced” and the experience of Sardex.net in that respect might prove very useful.

An interesting example in this regard is the idea of a “CommunityCoin,” a blockchain-based currency for service exchange inside a Community Network. This idea was initially presented by

³⁵ In English “Tomorrow”, see <https://www.demain-lefilm.com/en>, accessed 23.11.2016



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Manos Dimogerontakis at the 2014 Battle of the Mesh³⁶, and later proposed for the Google Summer of Code by Freifunk³⁷.

As stressed in this Google Summer of Code call, *“the coin reward is not based on the block finding but in the contribution and participation of the community individuals. A set of algorithms will analyze the community communication mediums such as:*

- *Contributions in the mailing list*
- *Number of nodes working*
- *Traffic (data) of these working nodes*
- *Services added by the user to the community*
- *Participation in the code*
- *etc...*

These algorithms will run in a central entity, which transparently will calculate the reward: how much and to which users. The blockchain miners will consult this entity for each new block to decide how is the reward spread (transactions for the next block). A small reward will be also given to the miners for finding new blocks to incentivize the mining process and validate new transactions.

This currency may be used for the internal community workaround. For instance if user John has a proxy service which moves 10GB per day, he will be rewarded with 10 CommunityCoins. Afterwards he will be able to spend these coins to pay a video-on-demand service or to buy a second-hand hardware to another community member. So at the end, the motivation of the system is to incentivize the community members to work for the community (installing new nodes, creating new services, selling old hardware, etc.) and make the community model self-sustainable.”

However, this didn't lead to any concrete implementation yet and indeed as we have argued here, a more sophisticated mechanism for creating incentives is not sufficient if no meaningful link to the real local economy is integrated. Only if a relation and validation between contributions, consuming activities and meaningful recording of such economic transactions is made, a community currency will succeed.

For this, a currency based on the principles of the commons-based district currency is very interesting to explore. The fact that Guifi.net has already integrated in its compensation system the concept of the commons, materialized as a separate resource pool to which all participants are encouraged to contribute in addition to their bilateral economic relations, makes the two models at least compatible and this is an avenue that we will explore in future work.

³⁶ <https://github.com/p4u/communitycoin-speech>, accessed 23.11.2016

³⁷ https://wiki.freifunk.net/Ideas_GSoC_2014#CommunityCoin_.28GuifiCoin.29, accessed 23.11.2016



5.2 A CN becoming part of a CC

On the other hand, a community network could be itself the driver for a wider local economy, in which Internet connectivity could become one of the goods exchanged. For example, imagine Guifi.net becoming member of one of the under development complementary currencies in Catalonia (i.e., the Mercado Ecosol) which is part of a wider network of cooperatives, XES³⁸, of which Guifi.net could also become part. Then also members of Guifi.net could be involved, maybe by a subset of the currency which would also fit in the special needs of these members.

If cleverly adopted, this collaboration could boost both sides. But during such an integration one should be careful not to threaten one of the success factors of Guifi.net: The clear distinction between network and content, and the clear focus on the network, leaving the participants to organize and populate it with the contents they want. At the moment, there are also more opportunities in the Barcelona region, because the municipal government plans to support social and solidarity economy by a new plan for the period of 2016-2019. In this plan a so called social currency will be introduced in a first pilot from 2017. This might open a window of opportunity to a new kind of combination between CNs and CCs³⁹.

The complementarity could also offer help into the other direction. As mentioned above: The analogy towards the networks would help to clear the two layers of accounting and of value and distinguish them better. That would especially help currency designers and managers to take more accurate measures towards malfunctions. E.g., today one malfunction of the ruling currencies is their systemic support for growing inequality. In a complementary view as achieved here a discrimination between somebody who is “rich” by his contribution towards society (service, work, power) and somebody “rich” by systemic failures, overspill or manipulation of “protocols” and rules could help to solve the problem of inequality. Diversity and complementarity of models is therefore a way to contribute to sustainable and stable systems.

5.3 Educational games

The goal of educational games and gaming simulations, also called “serious games” is the promotion of experience-related teaching and learning forms that contribute to the simulation of processes (i.e., economic, technical and social processes) and to the development of systems-competence in various areas of life. It is used in different fields of scientific research and there is an

³⁸ Xarxa d'Economia Solidària de Catalunya, a large network of solidarity economy in Catalunya, already experimenting with community currencies, <http://www.xes.cat/>, accessed 23.11.2016

³⁹ New developments in Barcelona: <http://www.euronews.com/2016/11/16/barcelona-set-to-introduce-local-currency>, accessed 23.11.2016 Detailed description in Catalan: <http://eldigital.barcelona.cat/wp-content/uploads/2016/11/plaAltresEconomies.pdf>, accessed 23.11.2016



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international researcher community working on the topic of gaming for more than four decades (see e.g., Greenblat, 1988)⁴⁰.

The idea of using educational games for the development of new community currencies and for the adoption or introduction of such currencies into a community was born out of the inherent difficulty to evaluate new currency designs from their description on paper. Different approaches of computational simulation of such new systems were done by Flexibles economic research & development, Zurich and the University of Applied Sciences North Western Switzerland (FHNW) between 2010 and 2013⁴¹ (see also Martignoni, forthcoming). The results were very useful but the theoretical framework of a new currency system is still very difficult to communicate to people who might be willing to set it into practice. Also, a lot of human behaviour would not work exactly like in the models.

The idea of “playing” a currency came up and was first realized by the “City-Money-Game”, an educational table game demonstrating effects of a secondary or complementary currency and a basic income in a city-neighbourhood. To unite the efforts in money and currency gaming and simulation the Flexonomix® brand was created. The publication of games is preferably done as open source or under creative commons but the brand should guarantee high quality and a scientific approach⁴².

To demonstrate the possible implementation of a district currency (see Section 3.8), the simulation “district-currency-game” was developed 2014 as another Flexonomix game and tested different times, e.g. in schools. This game has now been refined and divided into two versions:

- **Demonstration Version:** To show the basic concept of a district currency, give a taste of its functions and raise (and answer) questions about community and currency in general. This can be done in a workshop of 1.5 to 2 hours
- **Full Version:** To show the detailed concept and functions of a district currency, experience how “it would be” using one and learning about systemic relations, budgeting and community decisions. This can be done in a workshop of minimum 3.5 up to 6 hours.

As a next step, an integration of the game with a locally hosted currency platform Cyclos is planned in the context of netCommons. This helps to demonstrate the advantages of an IT-supported currency, simplifies accounting and evaluation, but also brings closer the “simulation” with reality making it conceivable to organize games that could continue in reality.

One of the key characteristics of the district currency model, which is highlighted during the Flexonomix game is the commoning part. What this means in terms of game design is:

⁴⁰ A leading international forum for the exploration and development of simulation/gaming methodologies is the journal *Simulation & Gaming (S&G)* (<http://sag.sagepub.com>), but there exist several other scientific publications that testify the activity and development of this field.

⁴¹ A brief overview is available (in German) at <http://web.fhnw.ch/technik/projekte/i/ip213/komplementaer/index.html>, accessed 23.11.2016

⁴² see www.flexonomix.games, accessed 23.11.2016



- the implementation of a simulation of a democratic assembly that decides on the budget allocated for common tasks and the corresponding priorities;
- the appointment of a commons commission responsible to translate the tasks into concrete job descriptions, application and selection of candidates and execution of tasks;
- the total budget as a function of the total tax, and initial endowment calculations such as to make clear the value from contributing to the commoning tasks.

In the Appendix, we provide detailed summaries of the last three implementations of the game (the final one with an international audience) that have given focus to slightly different parts of the process.

The next step is now to develop a version of the game, which will be designed in a way that those elements are integrated, that are most relevant for the case of Community Networks. It then will be tested first in informal settings and later in more formal ways, and might become a part of the toolkit helping CNs to improve their economic sustainability.

5.4 Modelling abstractions and design tools

The core design feature of a currency is its aim: What shall it be used for? After defining the purpose and the expected participants, the most important challenge for its success is to ensure that it is a stable system and no imbalances will be created, i.e., the existence of many members with too much debt or credit, which would harm the fluidity of the currency and as is often the case result in the lack of overall activity.

For this, it is of critical importance in the currency design process to analyze the existing ecosystem and identify “circles” of exchanges that can keep the economic network active and balanced. A basic economic analysis could identify the existing money flow and the potential for either integrating unmet wants and needs or substituting fiat-money flows. This type of modelling makes sense either in cases in which the CN is part of a wider local economy or when the services offered by the CN go beyond Internet access.

Sardex.net is an invaluable source of experience and information on how to achieve such a complex task (see Iosifidis et al, 2015), and one of our most ambitious objectives is to carry out this exercise for the case of Guifi.net and then generalize and build guidelines and models that can help interesting communities to do the same.

In future work we will explore the use of modeling tools that allow the speculative design of such cycles in a hypothetical local economy, inside or including a Community Network like Guifi.net, a more rigorous analysis than the one made at the Google Summer of Code proposal for Community Coin.



6 Challenges

The introduction of such a complicated and not well understood mechanism as a community currency in the CN ecosystem is subject to some important challenges.

6.1 The duality between Internet access and local services

The fact that most people see CNs as ways to get affordable Internet access makes it difficult to promote the role of these networks as “catalysts” in a local economy, because the Internet resembles a commodity service and if this is the only service offered by a CN, it is difficult to imagine balanced circles for resource exchanges.

As mentioned in the SEED grants’ 2015 retrospective (Nucera, *et al.*, 2016), “*When we communicate with different communities they understand networks as the capability to have Internet access. They don’t understand why they need to use local network functionality, if the Internet exists. They also see all our efforts as trying to provide Internet access for free. Their understanding can be described with simple formula: Mesh = Wi-Fi = Internet.*”

We have analysed in Deliverable D3.1 a few key reasons why the deployment of local services make sense for a Community Network. An additional important reason for such services to be better understood and widely deployed is the fact that they are similar in nature and principles with the role that community currencies have in relation to the global economy.

In this context, it is important to stress that the *local dimension* of CNs (the provision of local ICT services instead of Internet access) and CCs (the support of the local instead of the global economy) does not aim to replace the corresponding global system *as a whole*, but provide alternative sustainable solutions for the part of the local needs that can be addressed with local solutions. To communicate well this complementary nature of both systems in relation to the global service that they seem to replace is one of the biggest challenges for both domains of local action, and perhaps they have more chances to overcome it if they collaborate.

6.2 Quantification of voluntary activities

One of the most common feedback from people introduced to the district currency is the quantification of labor that until now was meant to be voluntary. Such reactions exist also in the case of CNs and Guifi.net makes a lot of effort to keep a balance between the professionals and volunteers that are part of the network.

It is important to understand that commons oriented community currencies operate at the intersection between voluntary and paid work. On the one hand, they might monetize certain voluntary work. If the currency is well designed and the users do adapt it effectively it would be such work that already was difficult to find volunteers for or was always a quarrel because of insufficient quality of the volunteers' work (e.g., due to fast changing people or low attractiveness).



On the other hand, they are targeted to move a part of paid work from official currency to the community currency. By doing that the community regains democratic power over that part and increases its economic independence. As an additional advantage, it opens up a third choice in any economic activity: Paid by official money, remunerated by community money or voluntarily.

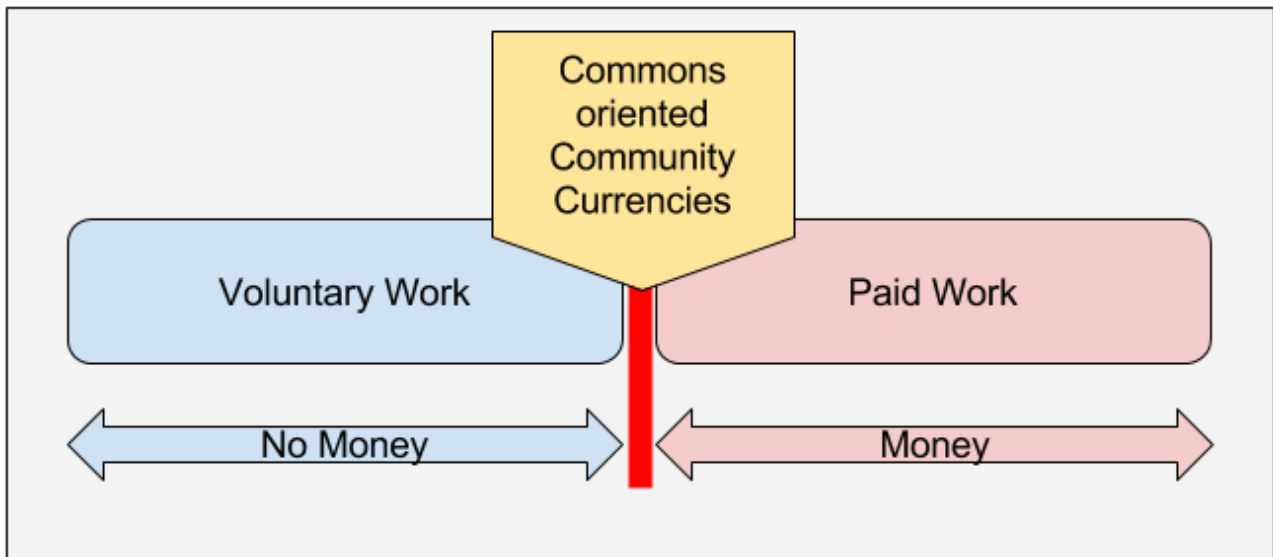


Figure 3: The two strongly separated spaces of today economic activity: voluntary and paid; and how community currencies could bridge it (illustration by authors)

6.3 Paid work and economic sustainability

The fact that community currencies attempt to increase the incentives for performing “once voluntary” work is compatible with our objective of increased economic sustainability. However, on the other hand community currencies “enter” also the domain of paid work. To this respect, they provide remuneration with a currency that is subject to more risks and less purchasing power. They can also create conflicts between professionals and volunteers providing the same service for an alternative currency.

Because we have no existing successful integration of a community network and a community currency the compound effects of such pros and cons are not yet demonstrable.

The evidence of a higher economic sustainability could be given by logical implications and empirical research on community currencies as stated in this report but also has to be developed and integrated into the next version of this deliverable.

6.4 The hype of cryptocurrencies

The huge success of Bitcoin and the hype behind blockchain has attracted the interest of hackers and technical people on the idea of an alternative currency. But the accounting infrastructure is only



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a small part of an alternative economy and for example, it is not concerned with the ways one can fulfil the requirement for balanced “circles” as discussed above.

However, technologies like blockchain are very powerful and generate enthusiasm. For example, despite the fact that CommunityCoin was not really deployed in Guifi.net, Primavera de Filippi writes “*CommunityCoin is a crypto-currency based on the same technology as Bitcoin, which has been specifically designed for network communities. It features a mechanism of rewards based on the contribution and participation of community members to the overall operation of the network. This currency can, however, only be used for the internal community workaround: users contributing their resources to the network will be able to spend the CommunityCoins they receive in order to e .g. buy a second hand hardware from another community member. The goal is, ultimately, to incentivize the members to work for the community (installing new nodes, creating new services, etc.) and make the community network self- sustainable.*” (De Filippi, 2016).

Similarly, in the most recent Guifi.net community meeting in Barcelona, there was a proposal by Manfred Karrer⁴³ to the Guifi.net community to adopt the Decentralized Autonomous Organization (DAO) approach, one day after the Ethereum hack⁴⁴, without a single mention to such threats⁴⁵.” Panayotis Antoniadis, responded to this for tech enthusiasts still attractive “offer” through a “lightning talk” the next day titled “*5 things you need to know when designing a currency for Guifi.net*”. These five things are worth including here verbatim as a summary of the main argument made in this deliverable:

1. *Cryptocurrencies offer a distributed solution for accounting but not for building a sustainable local economy (and they require less trust on humans, while they still fail)*
2. *There are many local currencies built against accumulation, speculation, etc., but they rarely succeed and they don't scale! (the reason is that they get unbalanced very easily)*
3. *There are exceptions of less “radical” systems that reach considerable scale and have strong impact, like the Swiss WIR and Italian Sardex (something like Guifi.net for the case of community networks)*
4. *Key secret: stay protected from, but compatible with the global system (and a lot of hard work and trust building)*
5. *To keep the balance there is need of diversity and dedicated resources (Guifi.net's compensation system can be supported by a currency only if integrated in a wider economy; this needs a lot of patience and a new foundation :-)*

After Panayotis’ talk, one of the Guifi’s co-founders, Ramon Roca, approached him to discuss in more detail the argument, and at the end of the discussion he concluded that all these are nice ideas,

⁴³ Manfred Karrer is the creator of Bitsquare (<https://bitsquare.io>), one of the first decentralized exchanges for Bitcoin

⁴⁴ <http://www.coindesk.com/understanding-dao-hack-journalists/>

⁴⁵ Manfred Karrer: Potential of Decentralized Autonomous Organizations for Guifi.net's compensation system, https://sax2016.guifi.net/index.php/Activities_programme. See also: <https://guifi.net/ca/SAX2016>



but there is no time and resources to explore them, which brings us to the last, but not least, challenge for combining community networks with community currencies.

6.5 Human resources and complexity

Perhaps the most challenging aspect of a community currency system is that it requires a huge amount of human resources to work properly and many such systems fail when the leading teams get exhausted. The same holds for Community Networks and combining the both increases the effort required for “both” parts. The required effort increases significantly when the need for answering the “Why?” question for both the individual solutions and for their combination.

In other words, the complexity for understanding the internal workings of these mechanisms but also the need for them in comparison with the already established global mechanisms that could serve the same high-level objectives, i.e., communication and resource exchange, multiplies when such solutions are combined into a single system.

This means that despite the evident advantages of the proposed combination, it is not easy to convince a community that already struggles to keep its system operational and ensure its sustainability to take the risk and do a pilot on a secondary plane that could undermine their “core” business.





7 Conclusion and next steps

This report documents the first steps toward bringing together experts in Community Networks and those in Community Currencies with the overall goal to exchange knowledge and experiences from different case studies in the two domains, and eventually to provide a powerful tool, a community currency, that can support the economic sustainability of Community Networks.

Having established some basic understandings of the similarities and differences between the two models we will progress according to the plan described in the previous section having as our next important milestone the IV International Conference on Social and Complementary Currencies in Barcelona in May 10-14, 2017, and titled “Money, Awareness and Values for the Social Change”⁴⁶.

This conference comes at a very critical moment when the city of Barcelona makes plans for introducing a new city currency and Guifi.net attracts more and more attention as a sustainable alternative to build and manage networking infrastructures as a commons.

Then the next version of this deliverable will include a more thorough analysis on how community currencies can be integrated with community networks and a more detailed plan for a community currency for Guifi.net in collaboration with UPC.

We will also report on further experiences from presenting the Flexonomix game in different venues and environments and possible improvements of its design and presentation.

We conclude this first version of the deliverable with the link to a submitted abstract to the International Conference on Social and Complementary Currencies in Barcelona (see Appendix), which will frame the collaboration between NetHood and UPC around this topic for the next 5 months. The task continues, to prepare meaningful and efficient tools for the improvement of the economic sustainability of community networks.

⁴⁶ see <https://ramics.org/barcelona2017/>



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Appendix

We included in the appendix three summary reports from the last events with the Flexonomix® district-currency-game (a collaboration between NetHood.org and Flexibles.ch) and a proposal for a conference as mentioned in the paper:

1. Game workshop in Wandellust, Zurich, February 29, 2016
2. Game workshop in Hunzikerareal, housing cooperative mehr als wohnen, Zurich, October 22, 2016
3. Game workshop in moneylab#3-conference, Amsterdam, December 2, 2016
4. Proposal for a paper and a presentation at the IV International Conference on Social and Complementary Currencies



1. Game workshop in Wandellust, Zurich, February 29, 2016⁴⁷

Contributors

Introduction, hosts: Ivelina Grozeva, Gerlinde Zuber

Game lead: Jens Martignoni

Supporting staff: Panayotis Antoniadis, Ileana Apostol, Fred Frohofer, Julia Weber, Paul Weixler,

Number of participants: 19

Invitation text

Today's money is not neutral but enforces growth at any price. The monetary system with francs, euros, dollars, etc. is privatized and systemically unjust. Rich are getting richer and the poor poorer. But there are other monetary systems that promote solidarity and justice and respect the principle of the commons - the community (or complementary) currencies. In the Flexonomix® District-Money-Simulation we start playing our own district currency as a support for commoning activities. We try this out with a simple, dynamic simulation together with all the participants. In this role-game money-circuits and functions are made visible and it becomes clear how abilities and needs, as well as freedoms and obligations play an important role in every money-system.

Framing

The “Wandellust” translated maybe as “pleasure of change” is a cultural initiative of young activists in Zurich organized in an association. They got the permission to use a formerly orthodox church building for a couple of years before it might be renovated. They installed there a co-working space and a place for cultural events in the main hall “Wandelhalle” (strolling-hall) and a bar called “Wandelbar” (changeable). The idea to do the game there was due to the fact that the 29th of February is a “presented day”, an additional time which should be used for pleasure and play, as the two leaders of Wandellust described it. The location was somehow ideal to test the district-money-simulation in its newest form because of its large and well equipped room, which could ideally represent a city-district with its buildings and facilities.

Summary

A first introductory lecture in the Wandelbar gave an impression of the ideas and tasks of a community currency and its role as a facilitator of common needs and individual abilities. After a short discussion, the people moved to the Wandelhalle where the situation and locations of the 13th (imagined) district of Zurich and the roles and rules of the game were explained and demonstrated to show how it would work out. Everybody got a name and role, some as members of the council of the inhabitants, one as banker, some as shopkeepers and many as the participating inhabitants of the

⁴⁷ See also <http://nethood.org/economy/district-money/simulation1.php>



district. Before the start, a city-song was performed by Paul. The simulation was played in 3 rounds, each representing one budgetary cycle (“a month”) of the life in this part of the city. During that cycle everybody had to earn some of the district-money “Q” to pay his contribution for the common goods the assembly of all inhabitants produced during that time. The creation of this special type of money was done by the council, creating and paying jobs for producing common goods. The type of goods would ideally be selected after discussion from the assembly of all inhabitants. Examples had been cleaning streets and places, setting up and watching a childrens playground, guarding elderly, etc. By the amount of work performed a certain amount of money entered and could be used also individually to buy services and products from other inhabitants or from the affiliated shops. At the end everybody moved back to the Wandelbar, where a final discussion and evaluation took place. Around 20-25 people participated in the game (fluctuation see below).

Remarks

The discussion started immediately after the introduction and one voter was pointing out that the kind of money suggested would never solve the world’s big problems. But later one he was enthusiastic about the game and saw a bunch of benefits. Creativity: After a short while the participants started to add their own ideas to game: What they could need or which additional services they also could provide. The acting became sometimes even real: One women, the owner of a hairdresser’s and beauty-shop started to give real massages to the participants and charged a “free contribution” for that service. She was very motivated to do that and get paid quite well. As in real world, some inhabitants moved in and some left the district. That's because some participants came late and others had to leave earlier. This fluctuation was visible in the balance sheet afterwards, but the system was robust enough nevertheless to perform well. In the closing round the idea to really think about putting up such a currency in Zurich was popping up. Nine people subscribed a list to be invited in the future discussion.



2. Game workshop in Hunzikerareal, housing cooperative mehr als wohnen, Zurich, October 22, 2016

The game was played in a full version of 3.5 hours in the environment of the housing cooperative mehr als wohnen in Zurich. The setting of the game and the real setting therefore were very close except from the fact that the participants were mixed between real members and inhabitants of the cooperative with people from outside.

Contributors

Host: Quartiergruppe Quartierwahrung

Game coaches/lead: Fred Frohofer, Jens Martignoni, Julia Weber

Number of participants: 11

Discussion

The discussion at the end was very intense and many questions were raised and some answered. A concluding protocol was made and afterwards elaborated, finalized and translated into English:

Minutes of the evaluation and final discussion

Original version in German by Julia Weber, FleXibles

Observations, questions and answers

How was the experience? What could be found? What observations were made?

After two rounds of the game, there are big differences between the players, what does that mean?

- We started with an amount (level) of 60 Q (Q = abbreviation for the district currency) per resident. The difference between the remaining amounts (in their wallets) of the individual inhabitants at the end of the second month is large: the difference from the lowest to the highest amount is already 240 Q (!)
- Four people are massively positive; all others have fallen below the cost. A person could no longer fully pay the monthly contribution and now has a debt.

Why is that?

- Have the one "consumed too much" and others "too much taken"?
- What can you do? Compulsory labour for processing debts?
- Are secured jobs for the next month a solution for those who are in the negative?



What redistribution possibilities exist? The question is: What happens with collections? Because these have effects, they cause blockages in the others. Is redistribution possible? And how would it be feasible? What are the possibilities for redistribution?

- One could introduce that who is more than, for example, 50 Q above a certain limit, it loses.
- Or you could pay those more tax / taxes.
- Donations, donations, to offset would also be conceivable.
- One could introduce that who has more than 150 Q, is to donate to the solidarity fund to donate.
- An imbalance to a certain extent is portable and can be compensated in the next moment.
- It could be the group of those who have done much, worked and contributed to exchange with those who have done little.
- You are not equally powerful every month. So, you have to budget for a long time.
- Short-term signing is possible when it is compensated.
- If, on the other hand, someone only collects, then there would be a limit.
- In electronic systems, an upper limit can be introduced, by what is about, automatically enters the solidarity fund.

Would not that be too much control? Do not we already have so many controls?

- The reasons for the imbalances must be considered individually.

Is it over-activity? What about a circulation hedge?

- This is not necessary in the case of the local currency, if the system is designed correctly.

How is it about control, how to trust?

And: Can the self-declaration be trusted?

- A cash system is non transparent, but dynamics are nevertheless noticeable.

What about the need to meet?



D2.4 Economic Sustainability

Some needs in the game could not be met. So it takes a certain size for a system to work. If the system is too small, there is a problem. Then the system becomes somewhat questionable. Not all needs need to be covered within the system with alternative currencies.

What is a working system size? What is the experience for a good size of a local currency?

- 200 people would need to participate to have a medium-term stable system.
- If everyone lives in the same place, it may well go with fewer people.
- A local currency makes sense only if not everyone knows personally, otherwise one can negotiate the compensation directly.
- It needs a good market place.

How is performance measured? Is the local currency tied to performance?

- In principle yes, the basic cycle is maintained by the (performance) contributions of the members.
- And what about people who can only relate to benefits and no longer provide them with aging, accidents, children?
- There are two possibilities:
 1. Creative Solutions, Extending Concept of Performance: Old people can tell stories, it is the question of how tight performance is defined. Ideas are needed.
 2. Solidarity Principle, Strong Weak Weaker: e.g. A solidarity fund can be used to bridge the gap in benefits or to support age and disability.

It would not be necessary to discuss whether only hours were paid for hours, At the "Swap At The River"?

Of course, one can discuss this, but this has its limitations, e.g. For products or service chains (example: a Yogastunde for 8 persons, how is it offset?)

What is the base of money-creation? How is it when there are too few jobs to generate Q's?

- The Commander is the driver. Other ways to increase the amount of money would also be conceivable. For example, very specifically define project funds.



- For example, Also a project that costs 1000 Q. These would not be skimmed off as taxes, but by using all that can also be increased the money, via community - not according to the system: not one profit, but the community profits and determines the without (it) cash.
- The newly created common room is, for example, a real achievement.
- e.g., The regional currency talents in Vorarlberg, who issue a large credit. They intend to enlarge their community.
- So, that the money does not become inflationary and the system is stable, but on average, money is the pure goes out again.

Is a basic income possible?

- A basic income that is paid out is also conceivable.
- There are control engineering questions.

Who prints the money?

- We print the money ourselves. That's what the states do.
- What is the difference now?
- In fact, it is not the state that prints the money but the private banks, but we believe it is the state.
- In the neighborhood currency, however, we really have control and certain as a community.
- Is the new money also printed?
- Yes, if the Community decides.
- Then could each individual print money?
- No. If it is a community decision, it is different than when it is an individual decision.
- Is not it then like a donation?
- No, because the value is secured by the community.

What about government taxation? Debt and tax authorities, what does it look like in Switzerland?

- It needs an accounting and an agreement with the tax authority.



D2.4 Economic Sustainability

- That the cooperative would pay globally tax / tax would be conceivable, but is not the goal. But certainly not individuals are taxed in an alternative currency or even taxed in state currency.

How about valuating? For example, One must specify the transactions, such as SFr. 1 to 1Q.

- If the currency is not to SFr. It is bound, but the goal would be a total solution.

Are taxes or income taxed?

- The tax authorities could also be said to be a closed cycle; In the end is zero.

This is only partial. Partially, jobs are also taken away from the labor market by, for example, The gardening work can be covered internally.

- No, the state does not save jobs. This is not the case now, because other jobs disappear without the state becoming active.
- There is an anecdote by Christoph Pfluger (editor of Zeitpunkt Journal): he wanted to pay his taxes in cash, but this was very difficult, because the tax authorities insisted on a transfer and did not want to accept cash even though they were legally obliged to do so. After several unsuccessful attempts he was able to hand over his notes to a clever tax officer against receipt.
- One aspect is also: We want to be taxed because we provide community services to the state.

Is not this encouraging black labor? What about the term "black work"?

- Black work means it is not taxed. Exchange or reverse charge, but is not covered by the term.

Are alternative currency, a link between global economy and the local economy?

Have I correctly understood, it is about the question of the common economy or the global economy and the alternative currency would be the link between them?

- In a way, yes.

How are outsiders involved? How is it for people who are not living here in the district?

- This should be discussed is not very quick and easy to answer.



- Also conceivable are alliances of several residential districts, resp. Cooperatives.

How to start? How to start with 11 people, how should the beginning be set (for example in the Hunzikerareal)? How is it, if it is entirely voluntary?

- ... difficult!
- It takes very committed people who want to have a job done.
- That is, the system is not yet functional when it has too many holes.
- What changes, compared to the present situation, where only a few are taking part in a voluntary currency and this is not going to happen?
- If it is a decision of the whole cooperative, it looks different. Then you drive the system up slowly, because there are jobs for those who participate and all commit themselves to make a contribution. It could then, e.g. Housekeeping work in local currency and the rent can be reduced.

How could the cooperative support the system?

It would be desirable if the cooperative recognized that the introduction of an alternative currency could be a great control instrument for many of the objectives it pursues and supports anyway. Examples from England and other countries clearly show that when whole cooperatives are involved and real value such as rental services are included in the system, the system receives enormous power.



3. Game workshop in moneylab#3-conference, Amsterdam, December 2, 2016

The game was played in an introductory version of 1.5 hours in the environment of the MoneyLab #3 symposium, for the first time in English. The time-set was very tight, but it was possible to demonstrate to the participants the basic principles of such a district currency with its strong link to the commons and a democratic decision-making and also have interesting discussions and some fun.

Contributors

Host: INC (Institute for Network Cultures, Amsterdam University of Applied Sciences)

Game coaches/lead: Jens Martignoni, Panayotis Antoniadis, Ileana Apostol

Number of participants: 21

Invitation text

The District Currency is a newly designed commons-based community currency developed by FleXibles in Zurich and now being implemented by NetHood and the netCommons project. The district currency is used as a role model to demonstrate the power of democracy and the commons through an interest-free monetary system.

The Flexonomix® District-Currency-Game introduces a district currency for housing cooperatives. The Flexonomix workshop will experiment with how a district currency can be implemented in housing co-operatives and lead to a commons based community currency. By inhabiting the role of a co-op member, participants will be asked to improve living conditions for the district using the skills and requirements of the community. At the end of each round, new decisions will adjust the process. Commoning through a currency incorporates the abilities, needs, freedoms and obligations of the individuals, as well as the effect of the collective community. The question of how to realize such a currency will be challenged through this workshop and different opportunities or threads might be explored further.

Remarks

The internal aim for the provision of the workshop at MoneyLab was to test out the English translation and the improved part of “micro-democracy”, the enactment of the commons assembly that should decide on the total budget of the commons activities and corresponding tasks.

The implementation of the game was very successful, although many aspects of it had to be shortened due to the limited available amount of time (only 1.5 hours including a short introduction to community currencies and cooperative housing model in Zurich).

The participants showed impressive engagement with their assigned imaginary roles, some offering “real” commons-based services like free hugs or attracting new people to our workshop room from



the outside, and even participated with passion in the assembly, some of which noting that we should rush them to take decisions before allowing everyone to talk.

One possible improvement, given the limited time, could be the assignment of a smaller initial amount of currency per person to be below the calculated tax of the first month, because in our 1-round version of the game people were given enough money to pay their task.

Finally, one of the criticisms, as is often the case, was related to the quantification of voluntary activities, as also mentioned in the detailed blog entry reviewing the game by the organizers (see below), the answer to which is discussed above, in Section 6.2.

Overall the feedback was very positive, and the game is now well designed, fully functional and can be easily offered in different occasions.

The review of the game by the official Website of the conference is included below⁴⁸:

Flexonomix District Currency Game

By Matthias Nothnagel, Institute for Network Cultures (INC), December 6, 2016 at 1:44 pm.



Jens Martignoni, one of the workshop co-leaders (Picture: Institute of Network Cultures, MoneyLab #3 Failing Better)

⁴⁸ Blog: <http://networkcultures.org/moneylab/2016/12/06/flexonomix-district-currency-game/>



D2.4 Economic Sustainability

The Flexonomix District Currency Game, an experimental workshop presented by Jens Martignoni, Panayotis Antoniadis and Ileana Apostol (nethood) allowed the participants to engage in a simulation aimed at testing the relations between micro-scale democracy and alternative currencies in the context of cooperative housing.

With more than 5,000 different local-exchange and trading systems worldwide (such as care currencies or regional and transition currencies), the necessity to find alternatives to existing monetary models has never been more prevalent. At the same time, the availability of land has become an increasingly bigger issue; a development that sparked the idea of cooperative housing (formed by a collective of actors that play in the real estate system). Once this social context of the housing crisis was explained and the extent of alternative monetary forms introduced, the workshop leaders addressed these issues with the proposal for a common-based currency called “Qs” (which was introduced in the context of collective living.)



Panayotis Antoniadis and Ileana Apostol (Picture: Institute of Network Cultures, MoneyLab #3 Failing Better)

The aim of the Flexonomix District Game is to make it easier to understand how currencies can be used in local co-operatives. The participants were invited to take part to a simulation of a housing cooperative, with every person co-owning and contributing to its success. Each participant was assigned a different function within the community: the four different types of roles included members of a commons-commission, a cash desk, business person, and lastly a general population



that formed the residents of the housing community. The game characters consisted of, inter alia, barbers, nurses, flower shop owners or football players.

After the assignment of the fictitious roles, the participants were asked to keep their roles for the remaining game and additionally were given “Qs,” the alternative currency. As the simulation of daily life in the housing cooperative began the participants engaged with another, traded jobs and material requests, dealing mainly with the question of how to define a certain tasks or jobs monetary value. Therefore, an open marketplace was established, where both offers and requests, based on the individual’s needs and abilities, could be posted. In a second step, certain job offers were designed, based on the marketplace’s collective needs.

After 30 minutes, the game entered its second phase, which consisted of a general assembly of all participants in order to address and reflect on the community’s needs and, furthermore, collect individuals' proposals for future purposes. All game characters could vote on which of the proposals they wanted to be implemented (or not) in their community (such as open medication hours, a community member providing free hugs, child care and pension plans).

Through the act of translating the notion of common-based currencies from a general concept into a performative, participatory experience, the game designers were able to not only present their idea but furthermore test it out and collect critical reflections on it. In addition to that, as the workshop conductors pointed out, the game included an inherent problematizing of bitcoin (as a global currency) as it emphasized the idea that democratic value already faces challenges at a local-scale. In a short conclusive reflection, the workshop participants were able to voice their opinions. Critique was addressed at both the process of democratic decision-making and the structure of the assemblies, and, more importantly, on the issue of generating monetary value for certain tasks, jobs and objects (cookies, flowers and so on). Since the currency of “Qs” is designed as a parallel currency, it can’t directly be translated into paid money and, hence, needs a constant reference in order to establish its value.

Some participants furthermore pointed out the problematics of the “monetization of everything” (including small tasks such as gardening work) and consequently led to a loss in community spirit. Due to the highly relational value of the currency, the boundaries between volunteer work and free market faded, and critique was formulated towards the dangers of “quantifying everything!”, which the game occasionally reinforced according to some participants.

The practical experiment is an important part of NetHood’s research and development and you can follow their other projects online.



4. Proposal for a paper and a presentation at the IV International Conference on Social and Complementary Currencies:

Money, Awareness and Values for Social Change, May, 10 to May, 14, 2017 in Barcelona, Spain

Special-Purpose Community Currency: The Case of Community Networks

by Panayotis Antoniadis, Jens Martignoni and Leandro Navarro

Community currencies provide a standardized way of organization by framing transactions and accounting for different types of resource exchange in a certain geographical area. They are further able to provide incentives for solidarity and local economic growth. Most importantly, they can be designed according to the local values and objectives.

However, no matter how attractive they look, at least for the proponents of self-determination and independence, few community currencies have managed to achieve significant scale. But mostly their design did not take in account “the power of the commons”. The most successful schemes until now have followed a pragmatic approach in terms of sustainability, such as the Sardex in Italy, the RES in Belgium, or the Bristol pound in the UK.

The paper wishes to build on the lessons learned from failures and success stories in order to design a special-purpose community currency for supporting specific commoning activities in the field of community networks that provide broadband Internet services, among others, like Guifi.net in Barcelona, combining ideas from Jens Martignoni’s District Currency for Housing Cooperatives and Guifi.net’s compensation system into a new special-purpose commons-based currency.

The goal of such a specialized currency would be to empower the members of such networks and their surrounding environment to build up and maintain their commons, and improve the economic sustainability of the network. To this end, a challenge that community networks face today, is the right balance between paid work and voluntary self-help activities, one of the main attributes of their identity, which is not enough to sustain them and help them grow beyond small communities of tech enthusiasts. Guifi.net is one of the few community networks that managed to address this challenge, by establishing a foundation that operates a sophisticated resource allocation and rewarding scheme, the compensation system. This scheme rewards those that contribute resources to the “commons”, the shared network infrastructure, and requests payments in EUR for those that wish only to consume, while the shared networks infrastructure allows also for a variety of bilateral service exchanges between members.

A community currency could replace the requirement for payments in EUR with the option to contribute not only in networking resources but also through other services outside the ones needed to sustain the network, making it more open, more independent, and a driver for the local economy.

The paper analyses some important design criteria for such a currency and presents a concrete implementation scenario for the case of Guifi.net, built around the existing compensation system and the eReuse.org initiative/case with a local circuit for computer reuse that also combines multiple actors in the preparation for reuse that compensate costs in a similar way to guifi.net.

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