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Delft University of Technology, The Netherlands  
Master of Architecture, Urbanism and Building Sciences  
Master Track of Urbanism, Research group: Design as Politics and Urban Metabolism  
**Krzysztof Pydo, 4328523**  
research mentor: Marta Relats  
design mentor: Birgit Hausleitner

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An aerial photograph of a city model, likely a thesis project, set against a backdrop of a vast, green, hilly landscape. The city model is composed of numerous white, rectangular blocks of varying heights and orientations, arranged in a somewhat irregular pattern. The surrounding landscape is a patchwork of green fields, some with distinct rows of crops, and a few small ponds or water features. In the upper half of the image, a large flock of white birds is captured in flight, scattered across the sky. The overall scene is bathed in soft, natural light, suggesting a clear day.

# CIRCULAR ECONOMY

*in the* **CITY OF THE LOOPS**

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THESIS PLAN:  
modelling an urban utopia aware of resources scarcity

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5th January 2015

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# 1. PREFACE

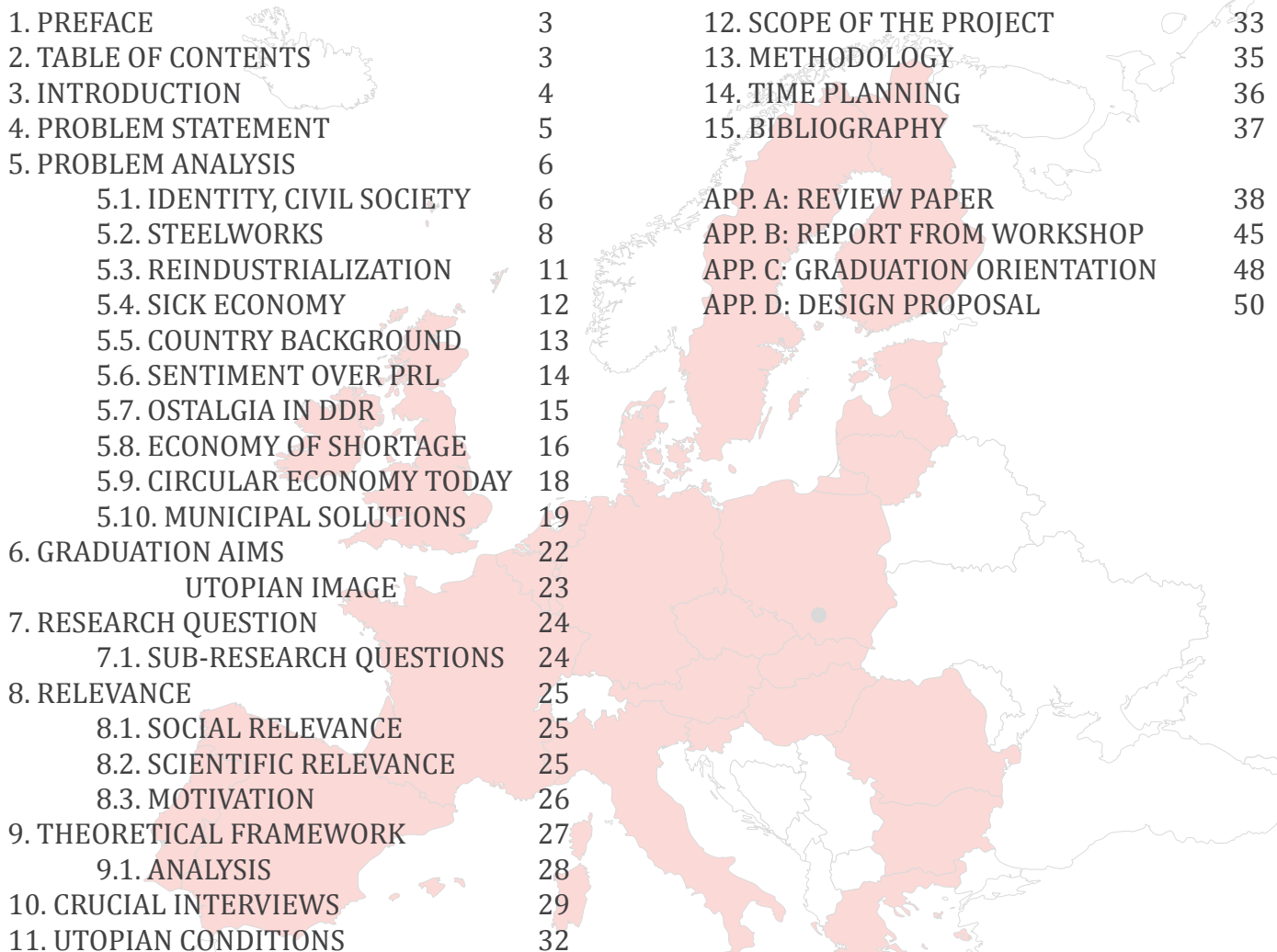
This is a Thesis Plan for the graduation project at the Faculty of Architecture of Technical University in Delft, the Netherlands.

The document consist of the process and planning of the master project. The final version of the document will be presented at the P2 assessment review. The Thesis Plan is written during the MSc3 semester of the Urbanism graduation track.

The content of this research would not have been possible without the feedback of Marta Relats, Birgit Hausleitner, Wouter Vanstiphout, Lidewij Tummers from TU Delft, Paweł Jagło, Maciej Twaróg involved in promoting Nowa Huta and Michał Stangel from Silesian University of Technology in Poland. Thanks for the time and dedication.

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### 3. INTRODUCTION

The following thesis plan is a part of the research of the Design as Politics Studio. The studio is “exploring, researching and defining boundaries, commonalities and tensions between the fields of politics and design”. The second edition of the studio focuses on the aspect of “government as a player in the social forces” and its expression in built environment. The underlined issues are the great input that the government has to express its politics and worldview through architecture and urban planning, as well as the growing demand of the societies claiming more influence on their environment. (Studio Guide, 2014, p.5)

Graduation Studio 2014/2015: *New Utopias on the Ruins of the Welfare State*, argues that Modern Architecture is strongly connected to the Welfare State (Studio Guide, p.6). This thesis addresses the problems of the ruin of the Welfare State in Nowa Huta located nearby Kraków in Poland. “The largest and the most ambitious of all the socialist cities of ‘People’s Democracies’, dwarfing all others in size and national political significance” (Lebow, 2013, p.3), Nowa Huta together with Lenin Steelworks was a symbol of the former communist domination across the Eastern Europe. “Unfinished Utopia” of Nowa Huta planned in 1949 as an independent city to neutralize importance of traditional Kraków (Lebow, p.14), already in 1951 became its part. Although being a flagship investment and a milestone in building socialism in Poland, the prior planner’s and politician’s concept, step by step revealed its weaknesses and the failure of the ideology behind it. (Lebow, p.40). Though the above mentioned shortcomings, the settlement for one hundred thousand people (Fig. 1, Fig.2) and steelworks, which was supposed to produce one and a half million tonnes of steel per year (Lebow, p.3), has been successfully constructed. In the following years Nowa Huta became a subject to expansion of Kraków and got lost in its shadow (Fig.3, Fig.4).



Fig.1. Model of utopian settlement. An example of well implemented concept of “urban unit” invented by C. A. Perry, source: [archirama.muratorplus.pl](http://archirama.muratorplus.pl)



Fig.2. “Unfinished Utopia” as a house for over hundred thousand of steelworkers. Most of them came from village, source: [archirama.muratorplus.pl](http://archirama.muratorplus.pl)



Fig.3. 1965: Nowa Huta as the settlement for steelworkers under administration of Kraków (own work)



Fig.4. 2015: Nowa Huta became a bedroom of Kraków with the identity constructed in opposition to the later one (own work)

## 4. PROBLEM STATEMENT

It has been 65 years after the first shovel was stuck in the ground to build Nowa Huta. Within these years the city accommodated already four generations in its social realistic architecture. During this period **the settlement has encountered many social problems (Fig.5, Fig.6), the environment has been seriously strained (Fig.7), cars have dominated the public space, architecture and its components have worn out (Fig.8, Fig.9), population has started to decline (Fig.10) and age, moreover the state of insecurity has increased and the steel industry reduced production (Fig.11)** (Local Program of Nowa Huta Revitalization, p.7-8). Last, but not least, **the political aspect of Nowa Huta gradually has been belittled. The location become a ruin calling for drastic change.**

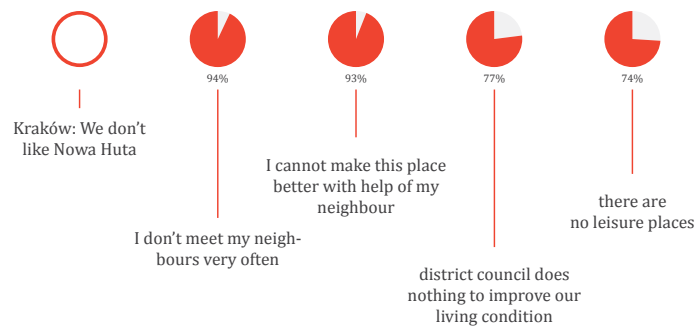


Fig.5. Public opinion surveys indicate that citizens of Nowa Huta are unwilling to interact with neighbours and think negatively about the possibilities to change the place, (own work based on Jagiellonian University, Safety in Kraków - Report, 2008)

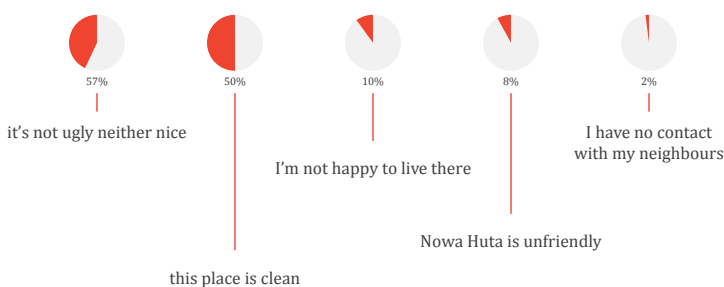


Fig.6. The same report reveals that the most of the people is quite happy to live in the area regardless of the poor conditions (own work based on Jagiellonian University, Safety in Kraków - Report, 2008)

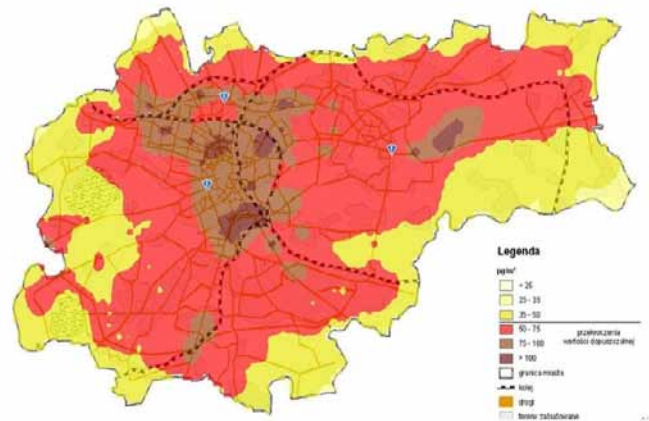


Fig.7. Air Pollution over Kraków and Nowa Huta. Red and brown areas indicate exceeding limit values. Source: Lesser Poland Air, Monitoring; <http://monitoring.krakow.pios.gov.pl/iseo/>



Fig.8. Majority of the buildings in Nowa Huta have not been restored yet since construction in 1949-1955, source: gazeta.pl



Fig.9. Citizens judge the quality of living in the district through the quality of public space, source: gazeta.pl

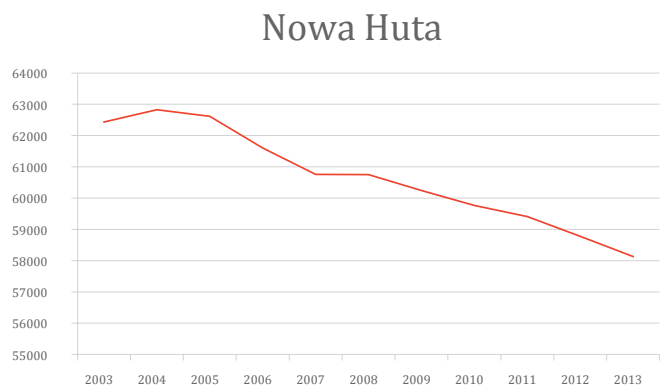


Fig.10. Population in Nowa Huta and surroundings is declining and aging. (own work based on Kraków, StatKraK; [http://msip2.um.krakow.pl/statkraj/view/show/start.asp?tab=n\\_info&id=1](http://msip2.um.krakow.pl/statkraj/view/show/start.asp?tab=n_info&id=1))

## 5. PROBLEM ANALYSIS

### 5.1 IDENTITY AND CIVIL SOCIETY

Nowa Huta since early beginning has been the area of economical and social experiment. The 6 year plan of industrialization of Poland, in which Nowa Huta was an important part, brought changes to the post-war Polish landscape. (Jezierski, Leszczyńska, 1994). Most of the working class that builded Nowa Huta housing and steelworks, stayed in the city and got the job in the steel factory (Fig. 14).

Workers that came from overcrowded rural areas after 1949, were the greatest substance to shape a new human - homo sovieticus (Fig. 13) that comply with the requirements of Soviet Union. The society in the eyes of authorities shall be submissive to the party and accept collective work that is given. It shall avoid taking initiative and responsibility, be opportunist, demonstrate lack of critical thinking and respect communist symbols (Fig. 15) (Marciniak, 2010).

Imposition of the identity onto Nowa Huta citizens, stored in social realistic architecture, cult of labor work, lack of worship places and ultimate submission, have never been achieved. Mass protest to defend the only cross in the area in 1960 (Fig. 12), war state in 1981-83 (Fig. 16, Fig. 17) and Solidarity movement that helped to change the system in 1989 (Fig. 19) demonstrate that the faith was stronger than the system.

Nevertheless even until now, the society, especially older generations are poisoned by lack of initiative and blame the authorities on every fail in the urban tissue. Civil society does not exist yet in Nowa Huta. Also, the identity is undefined and mainly constructed on the opposition to Kraków. (Jagło, 2014)



Fig.12. 1960's fights to defend the cross, source: wszolek.salon24.pl



Fig.13. 1968, Arranged assembly of the People's Party support, photo: Piotrowski



Fig.14. 1970's, Steelworkers end their change, source: nowahuta-tuitam.blogspot.com



Fig.15. 1973, Ceremony of unveiling Lenin Monument, photo: Maciej Sochor



Fig.16. 1980, imposition of martial law, source: zawszepolska.eu



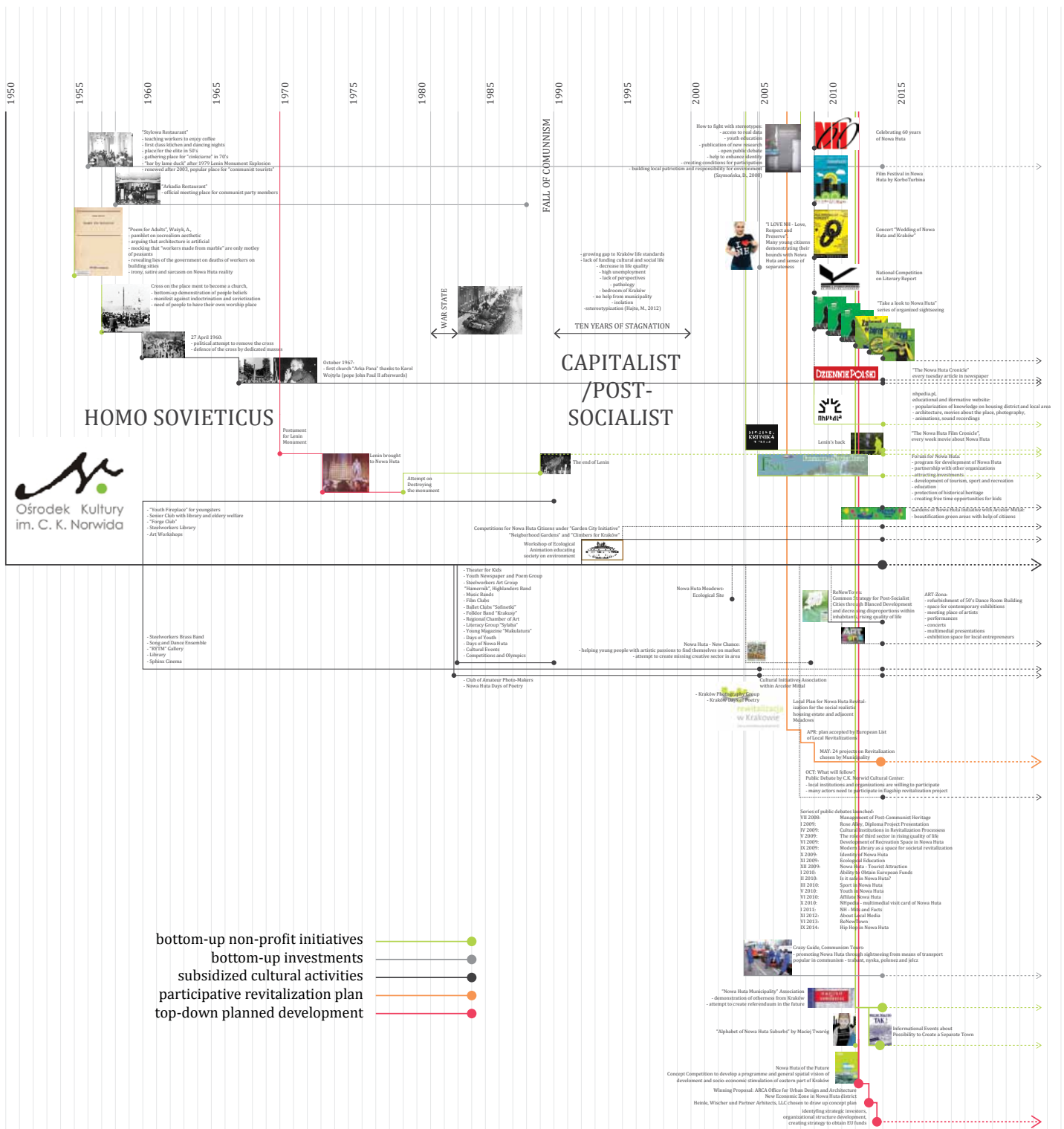
Fig.17. 1982 Street fights in Nowa Huta, photo: Stanisław Markowski



Fig.18. Queues to grocery shop as the commonness of Socialist System, source: wp.pl



Fig.19. 1982-89 Solidarity Marches in Nowa Huta, source: solidarnosc.krakow.pl



**POST CAPITALIST ?**

Fig.20. Mapping quest in finding identity of the place. Frequently neglected communist heritage passed into 10 years of stagnation in order to meet sprouting civil society. The civil society takes various forms in Nowa Huta. From completely bottom-up activities (green lines) such as Magistrat Nowohucki that tries to fight for Nowa Huta independence, to bottom-up private companies (gray) that promotes the place and take the material advantage of existence of monumental communist architecture. Activities organized around Norwid Cultural Centre (black lines) reaches to 1950 and are still evolving into new contemporary forms. Finally, partially participative Local Revitalization Plan (orange line) shows combination between top-down plan for revitalization and bottom-up public consultations, whereas (red line) Nowa Huta for the Future becomes clearly a political statement that involves no citizens, but large, anonymous investments. source: own work, based on Lebow, 2013., Hajto, 2013., Szymońska, 2008., nhpedia.pl, forumnowejhuty.org, magistratnowohucki.blox.pl, okn.edu.pl

## 5.2. STEELWORKS

Steelworks (pol. huta) was the only reason that Nowa Huta (pol. new steelworks) was constructed. It also was the largest employer between 1956 until 80's. "The Kombinat" (Steel Works) organized work, housing and cultural events in Nowa Huta producing 6,5 million of steel in the peak moment (Jagło, 2013). Starting from 1976, the steel crew has declined in number together with steel production (Fig. 11).

The disappear of the main employer created many socio-economical problems. After 1989, when it was clear that the steelworks will not reach the old heydays, people of Nowa Huta started to be marginalised. Steelworks came through series of adverse transformation into capitalistic industry and finally bought by international steel tycoon: Arcelor Mittal, has reached the small stabilization. Nevertheless, steel production declines, **factory is aiming to cut off unnecessary grounds** that needs to pay taxes for and the future is revealing **gradual disappearance of industry**.

Nowadays, steel factory produces rough steel elements such as wires, steel plates, rods, profiles, train tracks etc. The basic steel elements are mainly exported, but also gets to local businesses that process the steel into more complex com-

ponents, such as building reinforcement, fences, facade elements, steel containers, blacksmith elements, springs, steel grids, railings etc. (Fig.23)

**Resource such as steel is entirely recycled, nevertheless there is no industry that refurbish steel elements, tries to reuse them or upcycle, so that the energy needed to melt the steel is not wasted.**

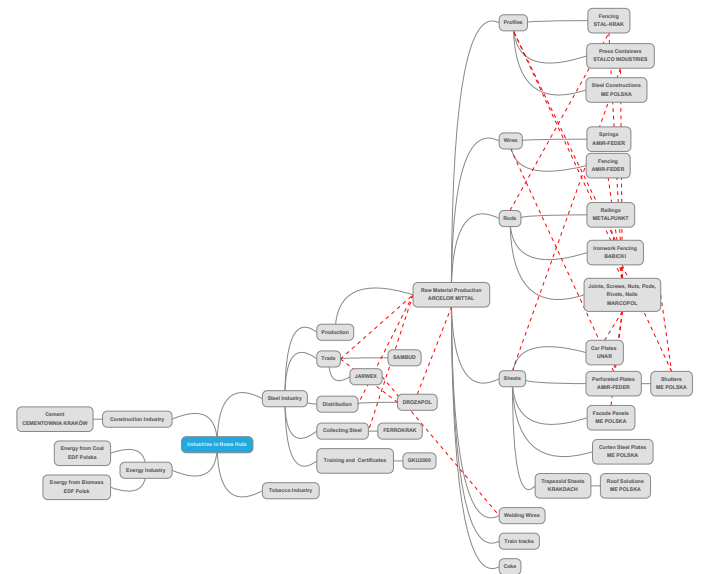


Fig.22. Mindmapping as the method to visualize steel flow in Nowa Huta (own work)

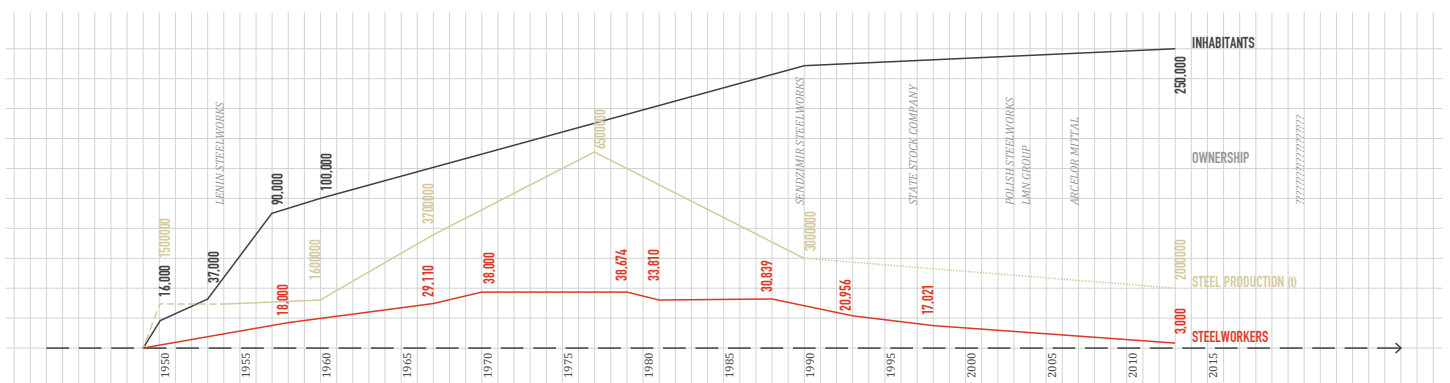


Fig. 11. Decline of Steel Industry in Nowa Huta. (own work based on information from: Lebow, K., 2013; Jagło, P., 2013)





Arcelor Mittal

size: +++++

<http://poland.arcelormittal.com/>  
2005 (1956)

local, national and international export  
producing rolled steel sheets, profiles, rods, wires, welding wires, train tracks, coke



UNAR

size: +----

<http://unarp.pl>  
1991

national production of car steel plates



Drozapol

size: +----

<http://www.drozapol.pl>  
1993

distribution of steel elements

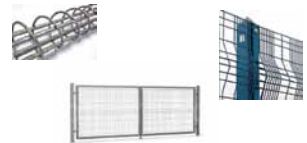


FerroKraK

size: +----

<http://www.ferrokraK.pl>  
2002

managing steel scrap



Stal-KraK

size: +----

<http://stal-kraK.pl>  
2005

prefabrication and montage of steel reinforcement in housing and industrial buildings; 1000 tonnes monthly



Sambud

size: +----

<http://www.sambud2.com.pl>  
1991

trade and simple treatment of steel  
300 000 tonnes per year



Stalco Industries

size: +----

++++-<http://www.stalco.com.pl/>  
1995

clients from western europe, middle-east  
producing press-containers



JARWEX

size: +----

<http://www.jarwex.pl/podstrona.php?id=1>  
2001

trade of steel welding tools

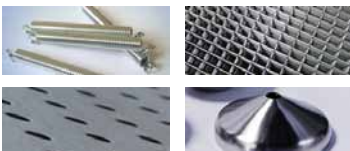


Bobicki Blacksmith

size: +----

<http://www.bobicki.pl/>  
1987

ironwork, metaloplastics, conservation of steel monuments

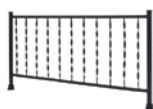


AMIR-FEDER

size: +----

<http://www.macro-jet.com>  
2012

distribution of perforated steel, springs, bottoms, steel grids



Metalpunkt

size: +----

<http://www.metalpunkt.pl>  
regional production of steel railings



ME Metal Engineering Polska

size: +----

<http://www.me.com.pl/>  
1984

preparing elements for architectonic solutions from steel



GKU 2000

size: +----

<http://www.gku2000.pl>  
2000

welding trainings, certificates

Fig. 23. From rough steel products to more complicated assembly and processing. There are several companies that find their profits in producing close to the steelworks. (own work)



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## 5.3. REINDUSTRIALIZATION

### About reindustrializing cities (Nawratek, 2012):

- 1) industry in cities will create multistructure society which is able to sustain its living and stabilize materially
- 2) building factories is more important than creating entertainment and cultural buildings; the latter will not replace factories
- 3) allowing informal housing is needed
- 4) polish young generations are very creative and productive, polish cities shall be more open to realization of their ideas
- 5) the city shall not be designed for middle-class since the middle class does not develop in Poland
- 6) recreation links between industrial processes and the city is needed
- 7) new wave of economical solutions is coming: circular economy, cradle-to-cradle, synergy in the city
- 8) people in Poland are to eyes fixed into Western Europe and tends to copy the solutions from those countries
- 9) fulfilling needs of middle-class shall be replaced by creating alternative systems

But what are the limitations to introduce the concept? Sick economy,



**KRZYSZTOF NAWRATEK**, born 1955, architect, urbanist, Ph.D. of Technical Sciences. Graduated in Silesian University of Technology in Poland. Lecturer in Riga University in Latvia and Plymouth University in the UK.

<http://www.funbec.eu/teksty.php?id=206>

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## 5.4. SICK ECONOMY

The transformation from central planned economy to the free market was a great challenge for the young state. The country is successfully chasing the Western level of life, nevertheless the chase is redeemed with unstable job market and mass emigration.

**The capital market after 1989 can be described in several points (Gadacz, 2003., Michalkiewicz, 2012):**

- 1) capital and money are in the certain area until it is profitable; it creates unstable future and avoid capital accumulation; the same as in colonial countries
- 2) investors do not care about future generations and the area around the factory since they do not live there
- 3) success in that system is not in finding yourself, but rather in winning a competition of adapting to current conditions
- 4) ethics and quality of work is very low, only management class is invulnerable and does not respect rights of workers
- 5) people are working overhours, without benefits, sometimes on weekends, since huge competition on the job market
- 6) access to the market is dictated by corruption and relations with administration
- 7) those who do not belong to the relation network and achieve significant success are cut off by the state apparatus (e.g. Roman Kluska, Optimus)
- 8) Young people who cannot stand the harsh conditions emigrates
- 9) 30% of national income is produced in gray zone in conspiracy against authority
- 10) public debt is growing to sustain inefficient social security instruments

Reindustrializing cities is as important as restoring friendly market for the citizens. Otherwise, demographic process can plunge the country into economical crisis.



**TADEUSZ GADACZ**, born 1955, philosopher, prof. Assoc., Collegium Civitas lecturer. Published: Freedom and Responsibility. Rosenzweig's and Lévinas Critics of Hegel Spiritual Freedom (1990), Philosophy of Human as the Philosophy of Fate (2000), Learning God Cognitively (2000), About the Skill of Life (2002).

<http://www.miesiecznik.znak.com.pl/gadacz573.php>



**STANISŁAW MICHALKIEWICZ**, born 1947, lawyer, academic teacher, eselist, publicist, politician and writer. Oppositionist in PRL.

<http://www.michalkiewicz.pl/tekst.php?tekst=2584>

## 5.5. ON THE COUNTRY BACKGROUND

Poland as most of the countries in Europe is approaching population decline and aging in the next decades (Fig.29). Nowa Huta like the rest of the country, experiences the problem of mass labor emigration to the Western Europe. Over 2 mil-

lions that is over 9% of country labor force (Fig. 31), spends at least 3 months abroad working below the level of acquired education. Together with the fact that the public debt is growing worryingly (Fig.30), the economical future of the state is in danger.

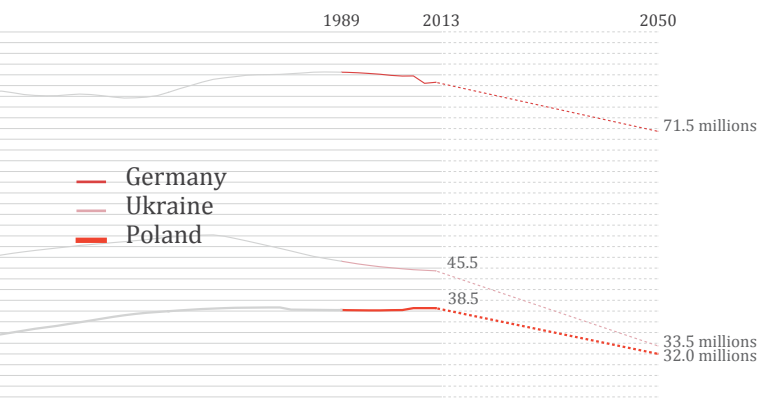


Fig.29. The population of Poland will decrease considerably in the next 35 years.

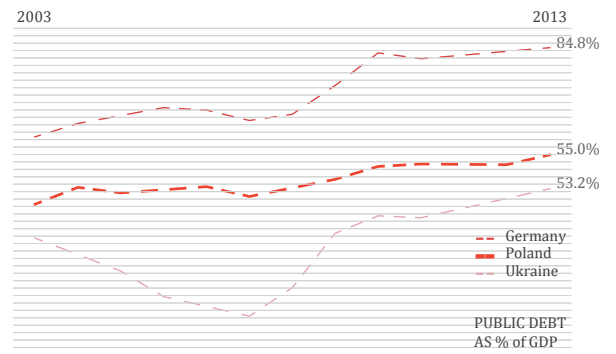


Fig.30. Growing Public Debt will cause in the future problems with GDP development and the solvency of pensions (Statistical Yearbooks, 2013)

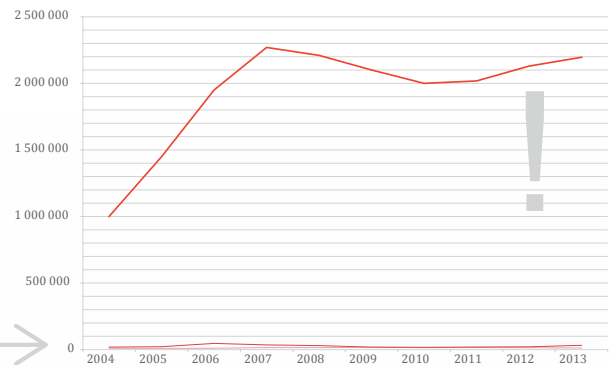
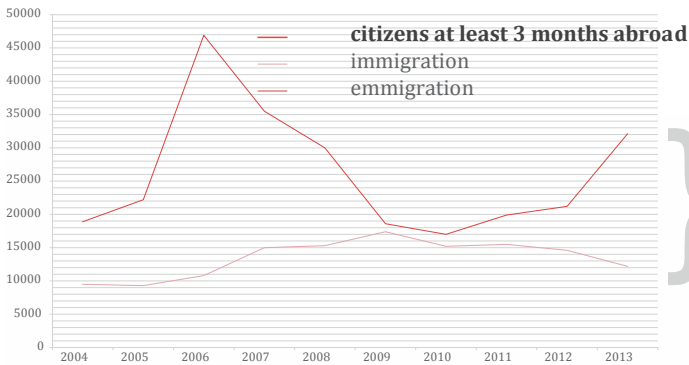


Fig.31. Since entry to the European Union, Poland records unceasing outflow of citizens. Estimates shows that over 2 mln of Poles are staying abroad for longer than 3 months!



## 5.6. SENTIMENT OVER PRL: DISAPPROVAL FOR STATUS QUO

According to the survey of CBOS (office for analyzing public opinion) 44% of people who knows PRL are missing that period.

### About sentiment for PRL (Jeran, 2010):

- 1) what we went through is always better than what we have now
- 2) people can find everything in shops today, opposite to PRL, but they cannot buy it. It is even more frustrating
- 3) our purchasing power is stronger, but there is more and more to buy
- 4) we have more to envy; social inequality is larger nowadays; social exclusion exists
- 5) because of goods shortage, in PRL, people inside family helped each other and took care of



**AGNIESZKA JERAN**, born 1978, sociologist, academic teacher, writer

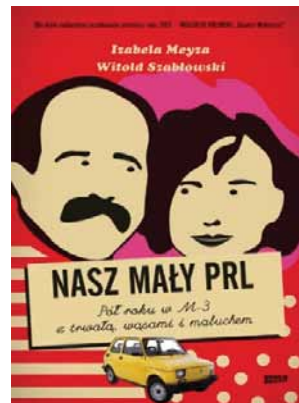
<http://www.pomorska.pl/apps/pbcs.dll/article?AID=/20100326/REPORTAZ/431931277>



Ministerstwo Śledzia i Wódki in Bielsko-Biała



The boardgame of year 2012  
Kolejka (the Queue)



happening: half year in PRL



Lorneta z Meduzą in Katowice



cloth branding back from PRL



Polska Kielbaska dla Ludu



communist tours in Nowa Huta  
in cars from previous system



students refurbishing "saturator"

Fig.32. Sentiment over PRL has brought a new set of cultural and entertainment entrepreneurs that bases their stylistic on the old times. Many of that activities demonstrates boldly, that contemporary identity of Poland is build on a great extend on Soviet pop-culture.

## 5.7. CASE STUDY: OSTALGIA IN DDR

### Ostalgie

A German term referring to nostalgia for the pace and specificity of life in former East Germany. Suddenly, after transformation of 1989, many amenities originally produced in Soviet Union disappeared from storefronts and were replaced by Western products. Today in Berlin, the heart of former GDR, the sentiment comes back, being a tourist attraction.

Is Nowa Huta able to profit from tourist on the same extend?



© amptelmann.de

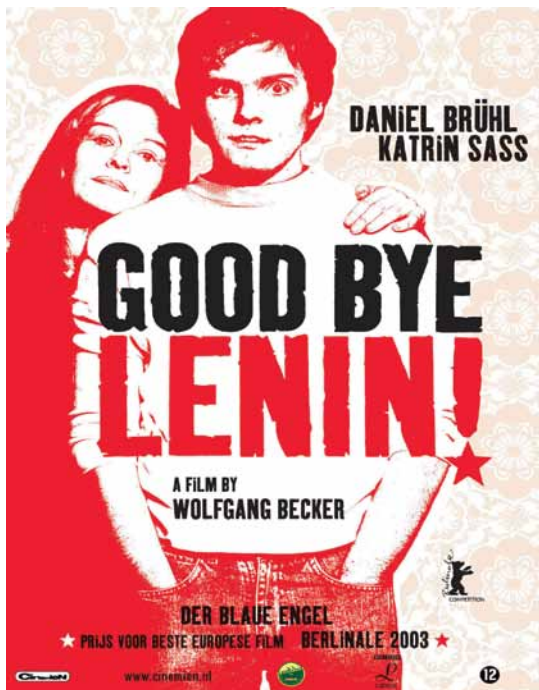


Fig.33. Berlin successfully became a place for communist tourism opening Museum of DDR and selling souvenirs referring to earlier era.

## 5.8. ECONOMY OF SHORTAGE IN PRL

That interesting point led to the research on the economy in PRL. The central steered production was inefficient and led to shortages in supply. In that conditions multicycling of resources, characteristic to circular economy was inevitable. Images below (Fig. 34, Fig. 35) demonstrates an album of solutions that was created when the resource scarcity appeared. Though, is 44% of Polish Society missing circular economy?



**BOMIS - OFFICE FOR REDISTRIBUTION OF WASTE:** National Institution, **mediating between enterprises** interested in getting rid of byproducts and the others which wished to purchase. From 70's and 80's selling defective products to everyone interested.



**SMALL REPAIRS (REPASACJA):** Hand-made **repair** of women stockings between 60's and 80's because of the high price of a new pair. Very popular **one-person business**, allowed by communistic state.



**SMALL VENDORS (CINKCIARZE):** Cinkciarz (eng. change cash), a person in PRL who illegally exchanged currencies. A type of **one-person firm**. Even if working in black market, unofficially not chased by the law.



**SMALL PRODUCTION AND SERVICE:** Another type of **one-person entrepreneurship**. **Manufacturing and repairing of daily use-objects** such as umbrellas, shoes was hard in soviet time, nevertheless possible. Products often were **cycling between consumer and producer**, who gained experience over time.



**SMALL CRAFTMANS:** Locksmiths, watchmakers, goldsmiths etc., were small, often family enterprises with specific type of craftsmanship, taughted across generations. Still visible on the market, slowly displaced by cheap mass production .



**KLUB RUCHU - CLUB OF READERS, BOARD GAMERS:** **Common place** for people interested in reading books, watch tv or play board games. Based on **sharing** devices and objects. Creating bonds in society. Popular especially in countryside.



**CZYN SPOŁECZNY - ARRANGED BOTTOM-UP:** "**Bottom-up activity**" arranged by the state. Usually managed and performed in free-days. Often believed to be superfluous, wished to create "a national spirit".

Fig.34. Circular Economy in PRL. Inevitable effect of central steered market. (own work)





**SATURATORY:**

Movable device saturating a liquid with gas. Popular in summer, belonging to former folklore. Characteristic for saturators was the use of **multi-use** glassess. After transformation, disappeared from landscape due to appearance of cheap bottled gas water. Recently reappeared in Łódź City.



**(PGR) State Agricultural Farm:**

Forced by Soviet Government **collective farming**. Relatively unefficient and subsidized by the government. Bankrupt suddenly after fall of communism.



**SPOŁEM:**

**Common Consumers Cooperative.** Established in 1868. Having patriotic character during the time of annexation of Poland between 1795 - 1918. During the communism time, gathering 61 680 members and 676 shops. Having monopol on many articles like Pepsi-Cola, cuban oranges, "Safety Soap" etc. Between 1984 - 1993, number of shops drastically decreased to 166 and 3 329 members, to reach 69 shops and 1 024 members in 2010. Cooperative even today is **aiming towards helping local communities** and successfully works within different political systems.



**BARY MLECZNE (Milky Bars):**

Snack Bar created in interwar period. Widespread in postwar time. In Milky Bars one can find traditional dishes, mainly vegetarian, based on diary products. Most of servings consisted of flour, eggs, groats, rarely with meat. Characterized by **low prices** (three times lower than in restaurants) calculated adequately to one cent. Supported by government, so that the **poor citizens can afford it.**



**BADYLARZE:**

Negative term describing **private entrepreneur (farmer)**, who delivered local communities **articles of first necessity**. Their activity was strongly connected with existence of the **economy of shortage**.



**ZAPIEKANKI:**

**Local Fast-Food** created in 70's, popular in PRL. Zapiekanka is a bread with topping as mixed mushrooms and onions covered with cheese.

Fig.35. Circular Economy in PRL. Inevitable effect of central steered market. (own work)

## 5.9. CIRCULAR ECONOMY TODAY

To become familiar with the circular economy concept check Appendix A: Review Paper.

Innovation, that is necessary to create circular economy system, is on a very low level in Poland. Within 28 EU countries Polish Innovation Index places the country on the 24th position.

Poland is basing mostly on non-renewable energy sources. Only 11,9% of energy is renewable, mostly extracted from biomass giving Poland 19th position in EU (Fig. 37). Domestic Material Consumption in total place the country on the 3rd place in Europe with 685 790 000 tonnes in 2013 which is 10,3% of the whole EU while being 6th most populated country with 38,5 millions people - 7,6% of the whole EU. (Eurostat)

The economy of Poland is recycling 72% of industrial waste. The rest which is 31 360 000 tonnes is landfilled. The domestic waste is smaller in amounts and oscillates around 9 600 000 million tonnes - 246 kg per citizen that is only a half of European average (Fig. 36, Fig. 38).

From waste that can be reused, 45% percent is landfilled and from what can be recycled, around 60% is not preserved. From electrical waste 1 out of 3 kilograms is collected (GIOŚ, 2014) (Fig.39, Fig. 40).

The stage of waste recycling in Poland, that is the main factor creating circular economy is on a low level nowadays.

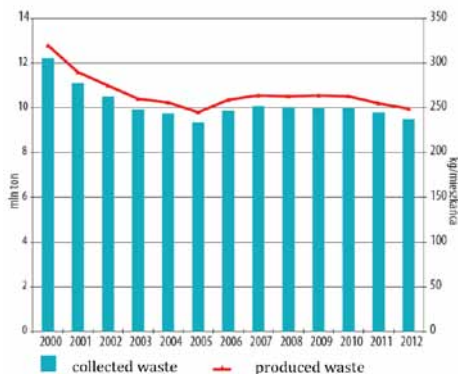


Fig. 36. Household waste production and collection  
source: (GIOŚ, 2014)

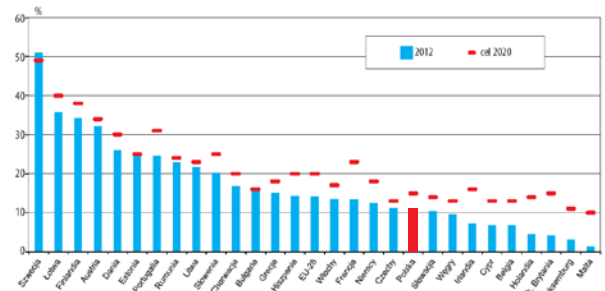


Fig. 37. Percentage of renewable energy in EU  
source: (GIOŚ, 2014)

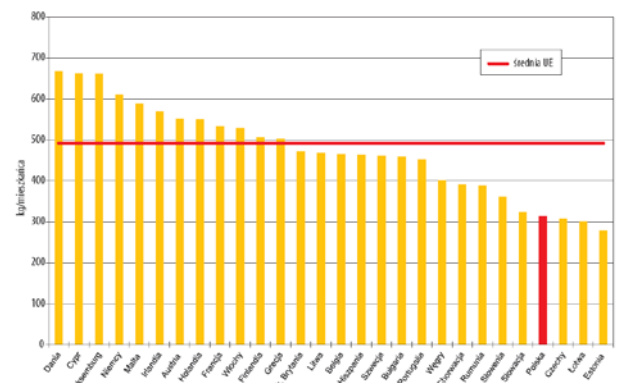


Fig. 38. Waste per citizen in EU  
source: (GIOŚ, 2014)

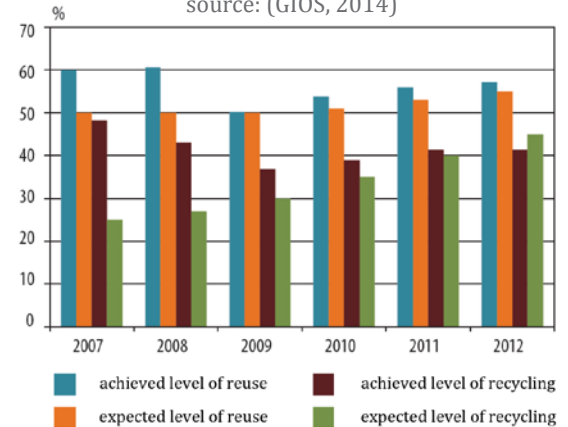


Fig. 39. Levels of Reuse and Recycling in Poland  
source: (GIOŚ, 2014)

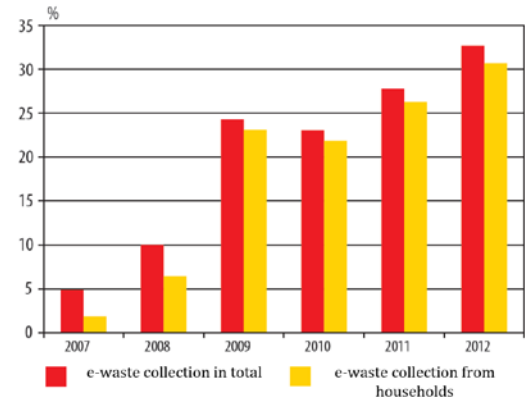


Fig. 40. E-waste collection in Poland  
source: (GIOŚ, 2014)

## 5.10. MUNICIPAL SOLUTIONS TO THE PROBLEMS

Nowadays the custody over Nowa Huta is held by the Kraków Municipality. The city endeavours to analyse the temporal problems of the housing estate, proposing standard solutions and looking for financing of the investment in “various European funds” (Local Program of Nowa Huta Revitalization, p.54). **The plan does not provide solutions for the people to earn a living, rather aims towards beautification of the area.** Public debates about the revitalization plan has revealed that weakness (Fig. 41, Fig. 42). Moreover, the plans that supposed to change the quality of life of the citizens are not widely known and since 2008 only a few of them are realized. (Fig. 43, Fig. 44)

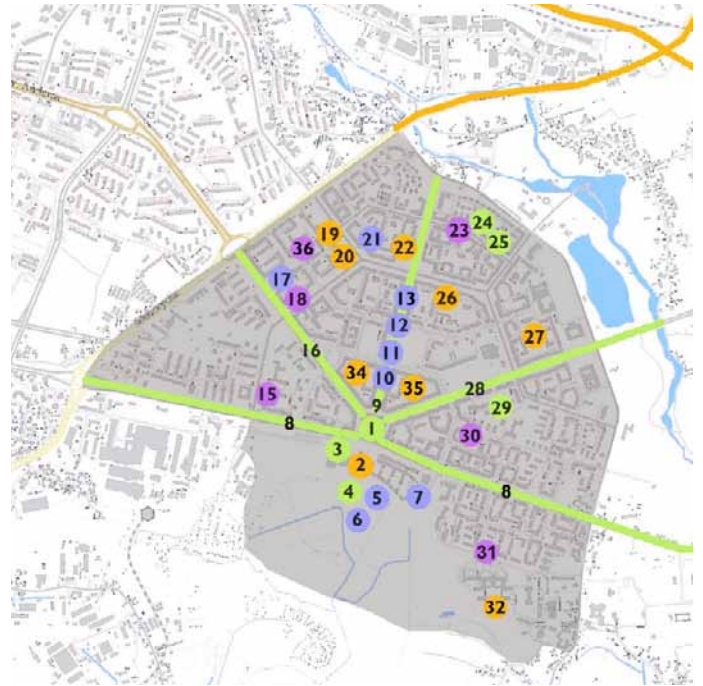


Fig.43. List of projects in Nowa Huta under LRP Program, source: Adamczyk, G., Municipal Revitalization Program for Nowa Huta, IX 2008, p.74



Photo by nchlsft/Shutterstock.

“So we must now, creatively, think to develop altogether; so everything have sense. Not like every man for himself. I hope that revitalization will not only be about architecture, but of social regeneration.”

- participant of public consultations

“We cannot only focus on one-dimensional beautification, since the burning issue in Nowa Huta is economic situation.

- another participant



Photo by nchlsft/Shutterstock.

Fig.41, Fig. 42, Inhabitants participating in the public consultation raise important questions for Nowa Huta future conditions.

source: LRP of “Old” New Huta”; public debates 7 III 2008; 4 IX 2014



- Do you have the knowledge of any LRP projects for Nowa Huta?

- No.

Fig. 44, 92% of the citizens of Nowa Huta is not familiar with LRP of “Old” New Huta” that is provided for them; public debates 7 III 2008; 4 IX 2014

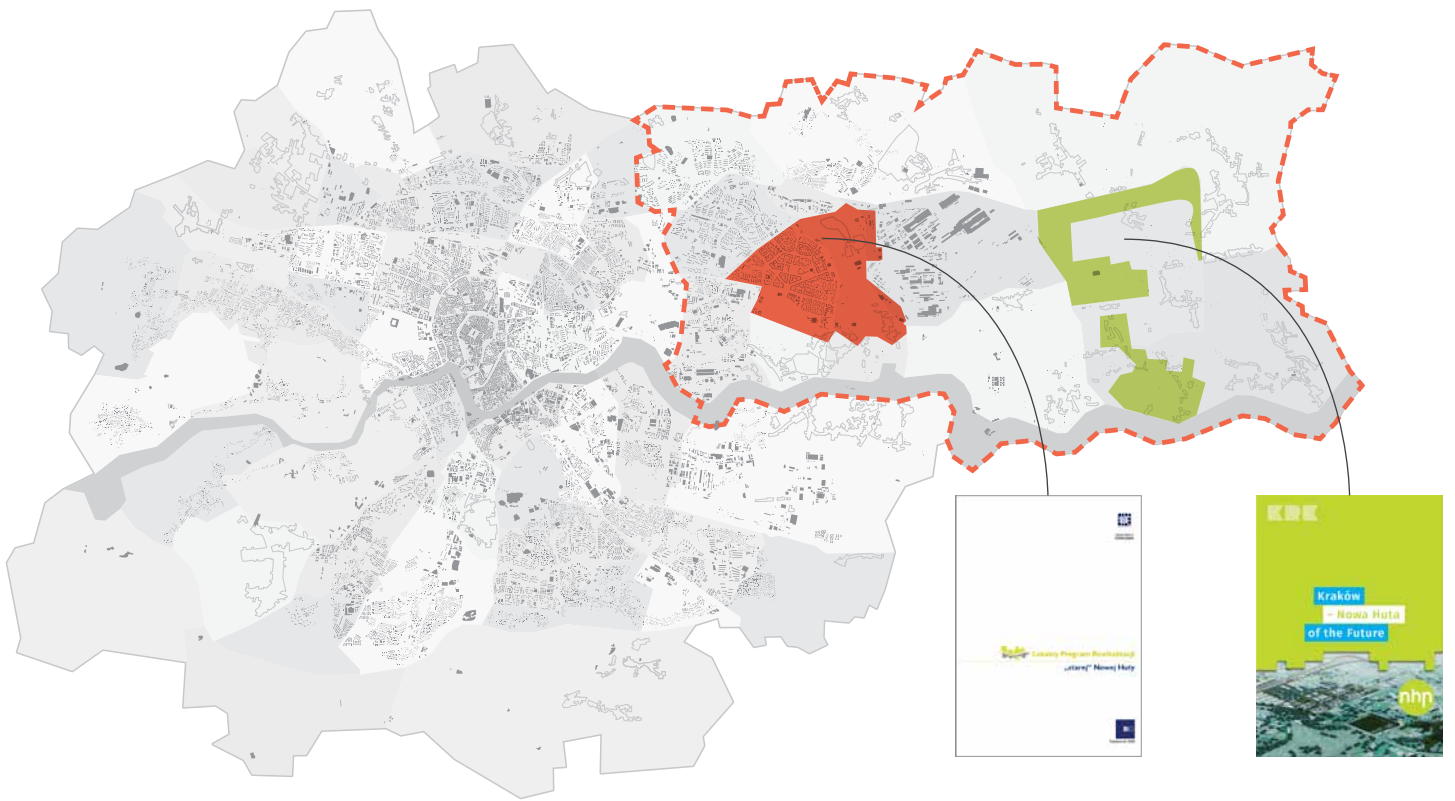


Fig. 45. Two, not interlinked plans for Nowa Huta that are dependant on European Funds. (own work)

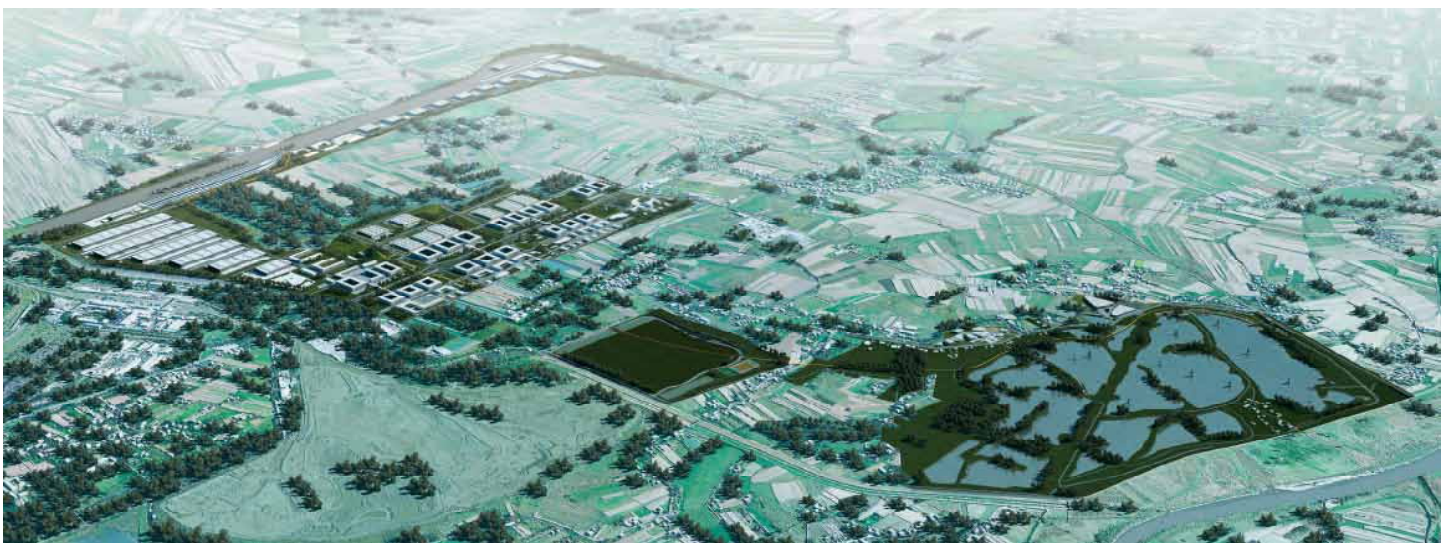


Fig. 46. Nowa Huta of the Future. "Smart City from a box?" source: City Development Department of the Municipality of Kraków

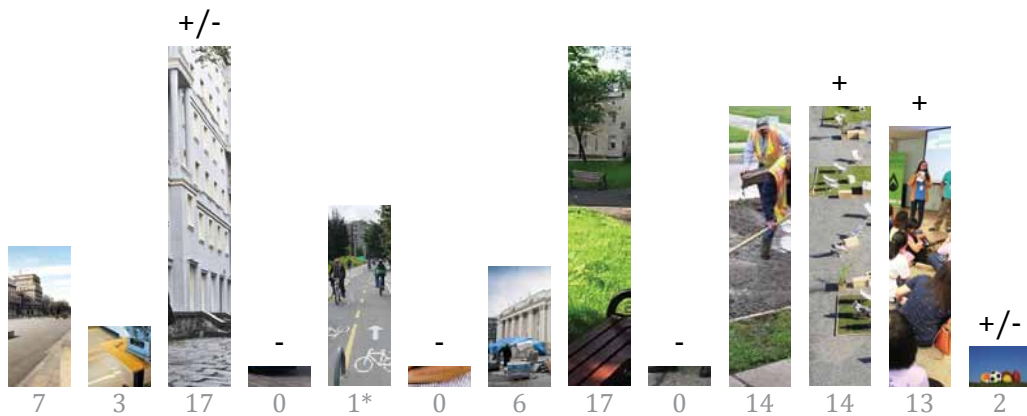
## user needs



Projects in Nowa Huta by user needs

source: LRP of "Old" New Huta"; public debate 4 IX 2014

## authorities response



Projects in Nowa Huta by destination (personal elaboration)

Fig.47. Local Revitalization Plan: Does the plan correspond to the need of citizens? Are the society needs far-sighted?

On the other hand the Kraków Council announced in 2012 an international competition called "Nowa Huta Przyszłości (Nowa Huta of the Future)" (Fig.46) requesting various offices to propose a huge investment project over the area located eastwards from the former Nowa Huta. **The lack of consequence in planning (submitting sprawling development before consolidating the city into more effective compact shape), rampant intentions such as the plan to expand the city by more than twenty percent, while demographic stagnation is predicted, and leaving Nowa Huta inhabitants aside to the plans have to be considered critically (Fig.47). Mismanagement and strong antypathy towards municipal authorities became a reason to declare willingness for autonomy in the form of activist group "Magistrat Nowohucki" (Fig.48).**



Fig. 48. on the 12th of December 2014 in the cameras of nationwide television, Magistrat Nowohucki declared wish of Nowa Huta becoming an independent city, source: Fakty TVN

## 6. GRADUATION AIMS

Studio Design as Politics challenges the graduation project “to think both in utopian as well as in an extremely realistic way: imagining a whole new society, but building it with what can be seen around” (Studio Guide, p.8). With this approach addressing the problems of Nowa Huta has to proceed in an extraordinary manner. The starting point of the research is to envision an utopian concept of the Nowa Huta self-sustaining urban system which evolves from existing conditions.

The utopian image (Fig. 49) that has been prepared in the beginning of the course refer to the concept of Lewis Mumford who states that the structure of modern planning is in a great extend responsible for vast social problems. The writer imagine the perfect habitat in the shape of medieval town, whereas people have had more organic relationship with the nature (Mumford, *The City in History*, 1962). The subjective image was a „design motif, that drives the design process and leads to the creation of a design from internal perspective” (Nagai, 2009, p.16). “ It leads the research into the context of the transition from linear to circular economy and the recent movement of European regions towards autonomy. Why Nowa Huta cannot be autonomous? (Fig. 50)

Therefore, the overall goal for the graduation project is to invent an urban utopia that tries to look ahead towards the better world. The world less dependant on the global market, with diverse regional identities, more responsible for natural environment and self-governing locally.

The aim of the graduation is not only proposing a quality improvement of the buildings and space around them as described in the problem statement, also creating a new urban living system. In that sense, graduation tries to extended the urbanist role towards being more active in the fields of economy and politics.

### Goals for the research part (see fig.XX):

- A) to research on the application of the circular economy to the urban development and the role of urbanist in that activity
- B) to analyze the local context and circumstances in order to propose exceptional scenario for the transition from linear to circular economy
- C) to get involved in the actual processes of getting independence in Nowa Huta
- D) to prepare complex analysis of the area in order to create a good context for utopian design

### Goals for the design part (see fig.XX):

- A) general political statements in which the independence is feasible in the form of national strategy or policy
- B) demarcation of Nowa Huta borders, indication of debatable public spaces and buildings that needs to be shared
- C) design of an urban system with the focus on economy, reindustrialization, resource flow and production issues
- D) conceptual design of social realistic urban blocks and part of the steelworks industry

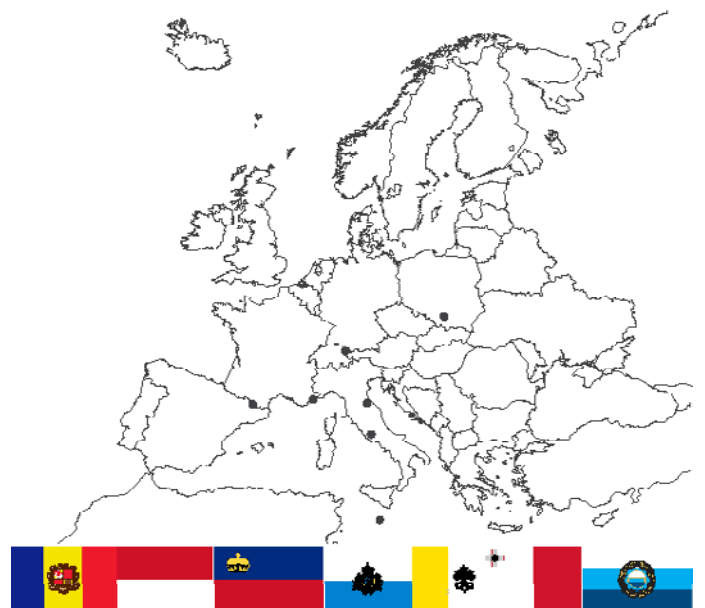


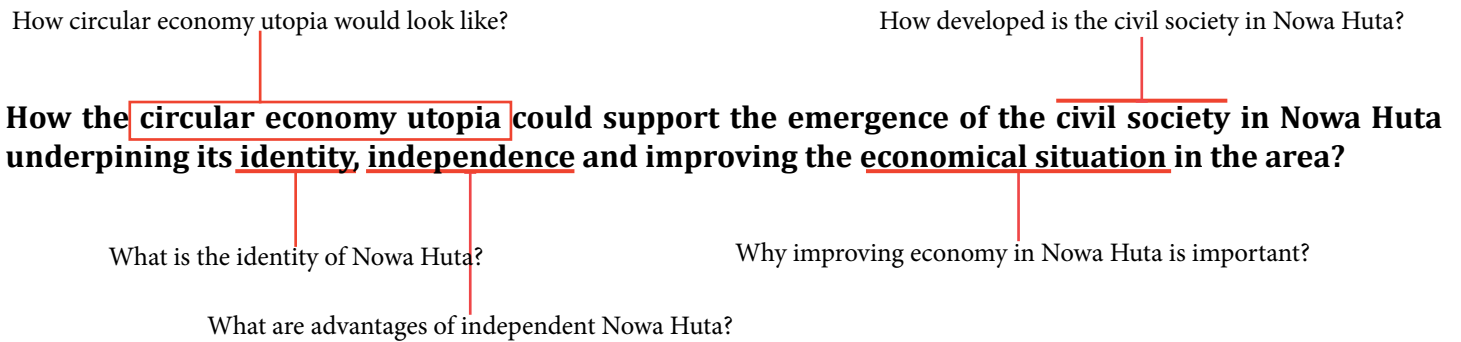
Fig. 50. Nowa Huta, a new independent microstate on the map of Europe (own work)



Fig. 49. Design Motif: the vision of Nowa Huta as a compact city that responsibly uses the available resources around it.

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## 7. RESEARCH QUESTION



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### 7.1. SUB-RESEARCH QUESTIONS

Sub-research questions in the graduation project will support the themes raised in the main research question by referring them to the spatial dimensions. That method shall help to focus on urban planning and design.

- 1) What are already known spatial concepts that facilitates circular economy? ————— **circular economy utopia**
- 2) What is the role of the civil society in the urban tissue? ————— **civil society**
- 3) Can the identity of Nowa Huta be co-developed by urban fabric, architectural forms, chosen materials etc.? ————— **identity**
- 4) What are the spatial implications of detaching Nowa Huta from Kraków? ————— **independence**
- 5) What typology of buildings, functions or public spaces can improve the economy? ————— **economical situation**



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## 8. RELEVANCE

### Design as Politics studio:

“the government as the great insurance company with an army is being deconstructed (...) and seems intent on making itself smaller rather than bigger” (Studio Guide, p.7)

### Manifesto for a Resource-Efficient Europe:

“In a world with growing pressures on resources and the environment, the EU has no choice but to go for the transition to a resource-efficient and ultimately regenerative circular economy.”

### Magistrat Nowohucki:

“What is good in the concept of Free Nowa Huta is the authentic alternative against what you can see in “the lounges”. This is about our backyard, our tomorrow, our city.”

The utopian project shall contribute to the overall research of Design as Politics Chair that explores commonalities and tensions between politics and design. Researching on possibilities of Nowa Huta to become independent not only on the administrative, but also on the self-sufficiency level with special attention to the aspect of reindustrializing area shall contribute to the concept of transition from linear to circular economy promoted by European Commission. Finally, the design shall be a spatial vision for the purposes of Magistrat Nowohucki, which is an active group promoting the independency of the city of Nowa Huta.

### 8.1. SOCIAL RELEVANCE:

The societal challenge that is fulfilling the gap after weak central governments (Studio Guide, p.7) is of high importance for the whole Europe. In the Eastern Europe context even more significant, since the civil society have never been decently established there. Moreover, in Poland, changing government since 25 years cannot solve or even do not see the problems of growing public debt, ageing population, mass emigration, decent health care system, pensions funds, earnings on the western european level etc.

Observing powerless and shortsighted government leads to exploration of new kind of systems, especially within young and active generation. In the European Parliament Elections in 2014 people within age 18-25 in the opposition to the rest of the society decided to support a political party that is EU-sceptic and stipulates serious limitation of the government role in the country. (Dziennik Wschodni, 25 May 2014). The graduation project that tries to imagine self-governing society seems to be very relevant.

### 8.2. SCIENTIFIC RELEVANCE:

On the other hand, European Commission on 17 December, 2012 has released a Manifesto for a resource efficient Europe that calls for transition towards “resource-efficient and ultimately regenerative circular economy”. The EU encourages innovation and private investment, smart regulation, accelerate transition, using taxes to stimulate innovation, promoting products and services that are less impactful on the environment and finally establishing the targets and indicators to measure progress.

Graduation project tries to reflect on the manifesto. Firstly, defining the urbanist role in the transition towards circular economy in the theoretical part. Secondly by examining the complex local conditions and possibilities within the research part. Finally, exploring possible design solutions for circular economy on many scales in Nowa Huta.

The master thesis will contribute to the existing state of knowledge on the circular economy per se, but also will try to answer the question: is there a way that growing need for market freedom and individualism of young polish society is binded to the “ultimate”and top-down planned transition towards circular economy run down by the European Commission?

## 8.3. PERSONAL RELEVANCE (MOTIVATION)

An interest in observing tensions between politics and planning has determined my choice of the graduation studio to Design as Politics.

Further, the location for research and design was chosen due to being familiar with Nowa Huta and the polish habitat in general. The product of research and design shall contribute to the development of urban visions that are almost non-existing in polish cities.

Finally, selecting circular economy based on local cycling of products as the basis for utopian vision I determined by personal believe that globalized economy creates imbalances in the world. Fortunately, the by-products or waste in the linear economy, become goods in the circular economy which results in the explosion of the people creativity.



Fig. 51, Fig. 52,  
Plant and herbs  
hangers:

on the left: "ikea  
socket"

on the right: recycled from plastic  
bottles.

Which one is  
cheaper and lasts  
longer?

sources:  
bp.blogspot.com,  
recyclart.org

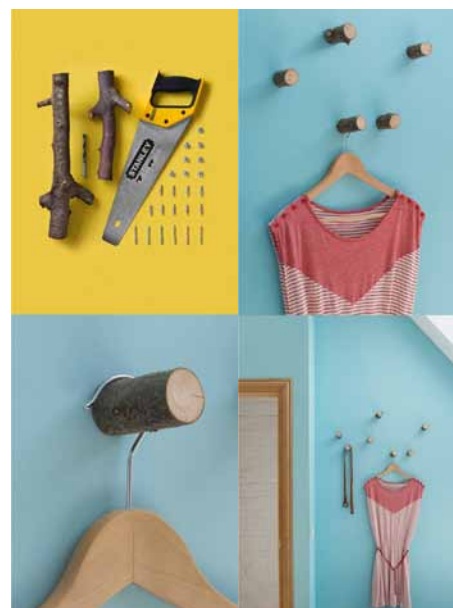


Fig. 53, Fig. 54,  
Cloth hangers:

on the left: "ikea  
bästis"

on the right: a  
branch found  
under the tree.

Which one is more  
sustainable?

sources: sumally.  
com, recyclart.org

## 9. THEORETICAL FRAMEWORK

To build a strong theoretical framework I treated literally the definition of (Swanson, 2013):

“The theoretical framework is **the structure** that can hold or support a theory of a research study. The theoretical framework introduces and describes **the theory that explains why the research problem under study exists.**”

The structure (theoretical framework) (Fig. 55) is constructed around three topics that have supported the development of the utopian conditions required to work within Design as Politics studio guidelines. The threefold literature review treats:

1) The edition 2014/2015 of Design as Politics is titled “New Utopias on the Ruin of the Welfare State. Thus, the literature on that topic is needed, to widen the horizons and create vibrant utopian-scenario.

2) Nowa Huta is the Ruin of the Welfare State with its problematics described already. It is a place that needs more than “comfortable realities of the past decades where ‘public and ‘government’ were always associated.” (Studio Guide,p.8). The literature assists in finding an identity of the place, its history and socio-economic potential. Nowa Huta is also a place that have its own autonomy movement “Magistrat Nowohucki” that the graduation project is a part of their manifesto to separate as an individual city.

3) Circular economy that supports the scientific background of the project and answers the request of the studio guidelines that is creating self-sufficient communities. The concept and its application in urban design and strategy are further described in Appendix A (Review Paper).

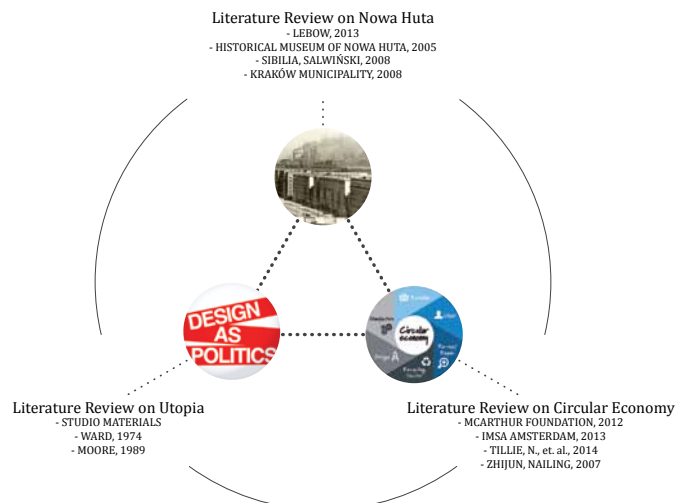


Fig. 55. Theoretical Framework of the Graduation Project

# 9.1. ANALYSIS FROM THEORETICAL FRAMEWORK

Confronting theories and literature, first concepts and analysis emerges (Fig. 56.):

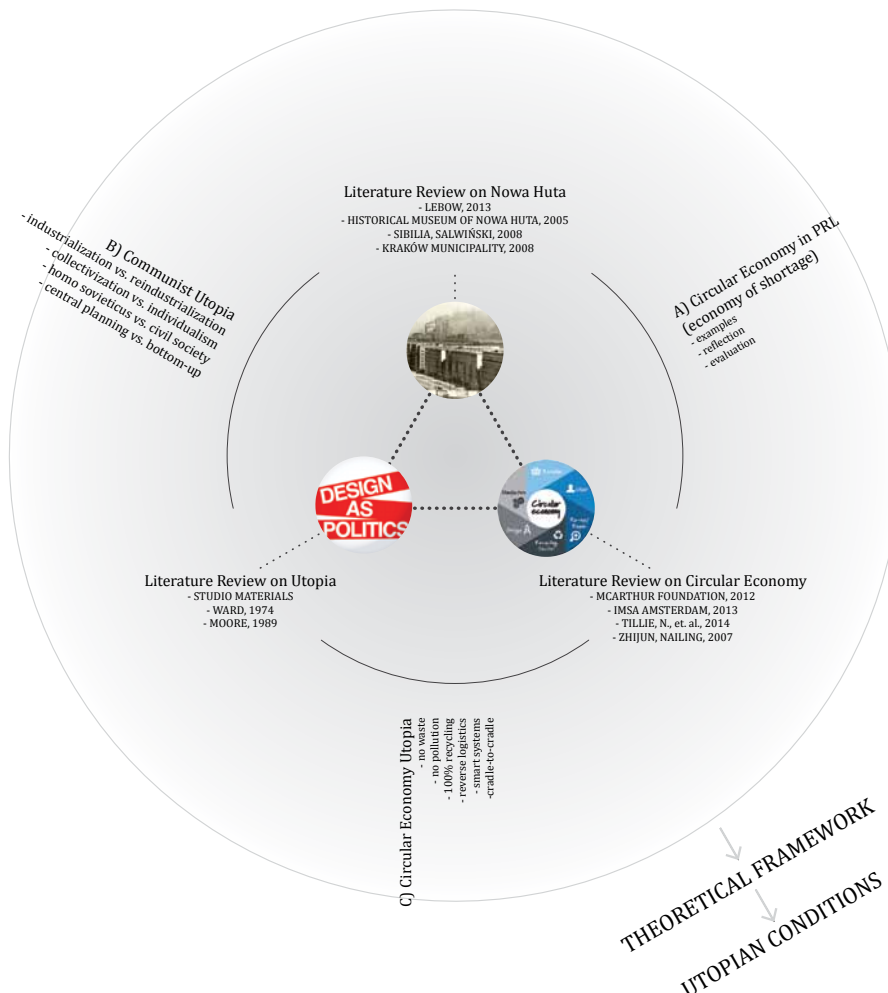
A) The circular economy concept that indicate resource scarcity was already present in Nowa Huta in the communist time as the economy of shortage. Further analysis demonstrates many examples from daily life in PRL that today are explained as circular economy i.e. reusing mustard glass as a drinking glass or institutions to exchange waste between industries. Nevertheless, the system was insufficient, forced and was a result from bad planning. Moreover, Polish citizens have no good memories with that “circular economy”.

B) Nowa Huta itself was an utopian project arranged by communist government. Industrialization of the country was necessary to build the socialist society.

But how on the ashes of existing centrally controlled Steelwork, create a society that works more from the bottom-up? The same dilemmas comes when reflecting on homo sovieticus - a person that life is organized by the communist government and that still exist in the non-communist country. The question of the emergence of civil society is inevitable.

C) Circular economy in general is the utopian concept. Absolute waste reduction, saving energy from multiple upcycling goods rather than instinctive recycling, reverse logistics that creates bond between producer and customer or finally, industrial system that keeps resources cycling are utopian concepts itself. How to implement them in Poland that landfill 75% of waste?

Fig. 56. Additional analysis arising from theoretical framework structure



## 10. CRUCIAL INTERVIEWS

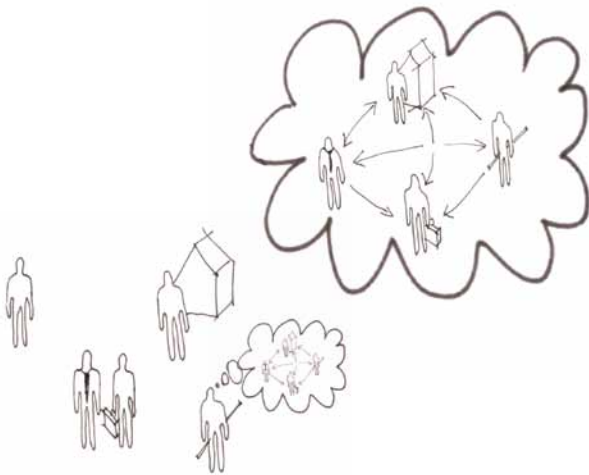
Interviewing people committed to Nowa Huta was an important method in assessing hitherto research findings, concluding analysis and making design decisions afterwards called “utopian conditions”.

Conversation with Michał Stangel, a polish urbanist who won Nowa Huta of the Future competitions on the role of urbanist revealed that the participation tools in polish urbanism exists only in theory. The urbanist mentioned the fact that the profession is not a decisive person while commissioned by private developers and in general society needs to be educated to understand better their role in creating cities.



***Where is the urban planning in Poland heading? 18 XII 2014***

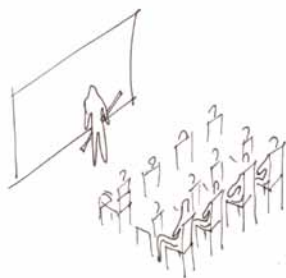
**MICHAŁ STANGEL**, architect, urbanist, Ph.D. of Technical Sciences. Graduated in Silesian University of Technology in Poland. Familiar with the city revitalization problematics. Set up ARCA urban design studio which won the 1st prize for “Nowa Huta of the Future”.



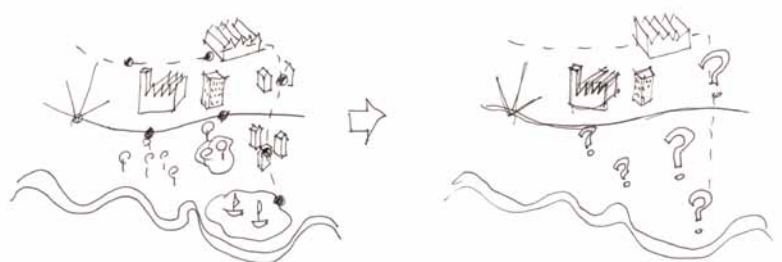
“Participation tools are weak and at the end of process”



“Urbanist has more to say while commissioned by the municipality”



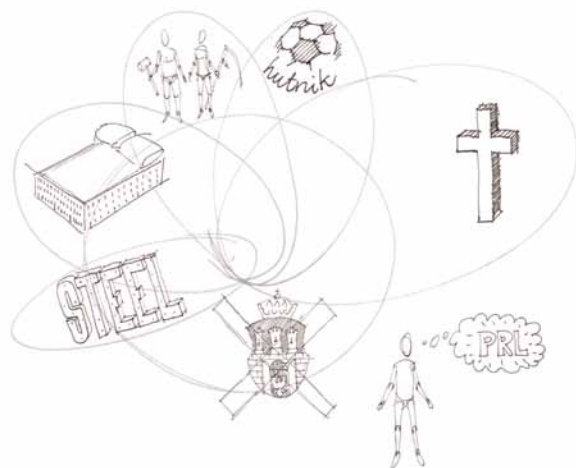
“Entire society needs a proper education”



“Most of the urban plans, such as Nowa Huta of the Future is revised and restricted by the economy”

Fig. 57. Sketches from interview (own work)

Another interview, with Paweł Jagło, historian from Historical Museum of Kraków, who knows the history of Nowa Huta by heart, demonstrated that Nowa Huta identity is created on the opposition to Kraków. The cult of steelworking did not develop and people are strongly rooted to the catholic faith. The future of Nowa Huta according to him is not optimistic. More and more people leave the place, the civil society does is in a form that is not able to decide for themselves and are still waiting for the municipality initiative.



“ Identity of Nowa Huta is mainly being constructed on the opposition to Kraków. The other significancies are the catholic faith, farm and manual labor roots. The other like sentiment to the PRL, or ‘steel culture’ are inconsiderable”

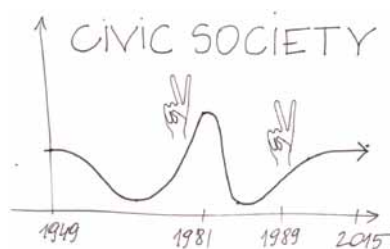


**Is there an identity of Nowa Huta? 18 XII 2014**

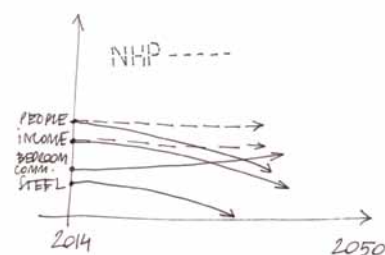
**PAWEŁ JAGŁO**, historian, writer, publicist, Kraków Historical Museum, Department of Nowa Huta History



“ Authority in PRL shaped a human that is not able to decide for his own ”



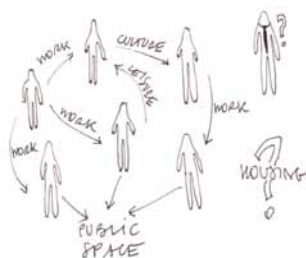
“ The civic society does not exist in Nowa Huta. It was succesfully erased in communism and it will eventually occur together with new generations. ”



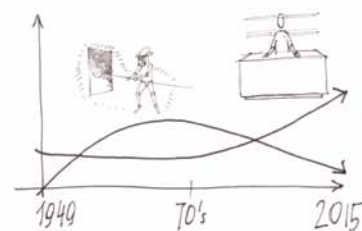
“ We shall be not too optimistic about the future of Nowa Huta. If there was no a plan for change, the place will meet a huge crisis.”



“ Authorities in the free country couldn't organize public space and housing for its citizens ”



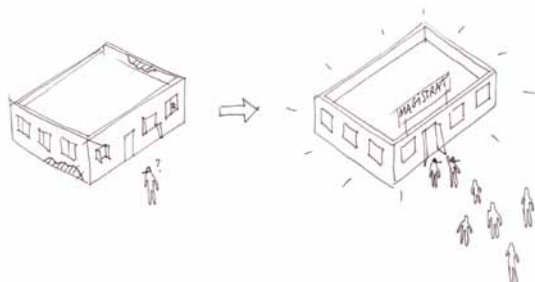
“ Young generation couldn't afford a flat, but hopefully is more active than the old generation ”



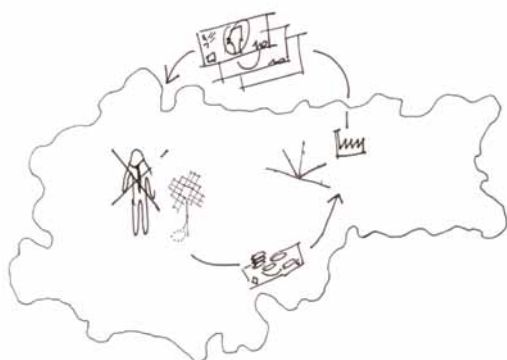
“ Over the years, less and less people from Nowa Huta are involved in steelworks, small businesses are more common. ”

Fig. 58. Sketches from interview (own work)

The last interview with an activist from Magistrat Nowohucki, Maciej Twaróg, revealed that Nowa Huta is a place of lot of plans but no action. The activist has drawn the demarcation line between Kraków and Nowa Huta and proposed a strategy in which Magistrat Nowohucki is the driving force of changes. The group of people involved in Nowa Huta should occupy abandoned kindergartens and theach young generations of useful crafts and arts and be taught to love their district since it will be their own city.



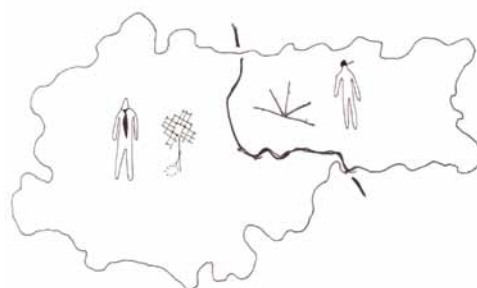
“ We want to take control over vacant buildings and return them to the society, but the bureaucracy is too complex”



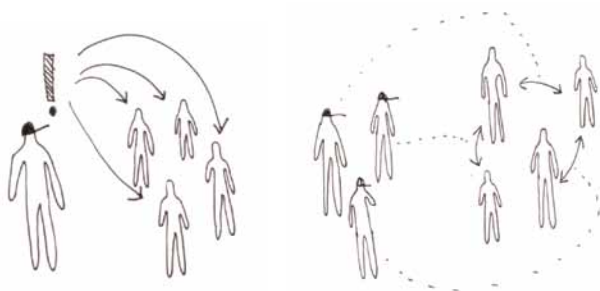
“ Nowa Huta is drained by Kraków Municipality ”

### *Why is the independent Nowa Huta better? 20 XII 2014*

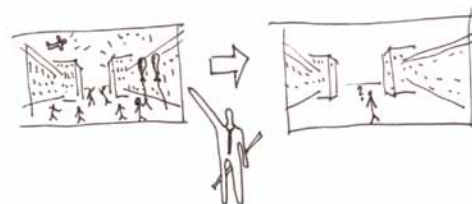
**MACIEJ TWARÓG**, local figure, politician, activist, writer; former alderman in Kraków Municipality; co-creator of “Magistrat Nowohucki”, which wants to separate Nowa Huta from Kraków



“ We need our own president, the border is clear for us. It will be the 12th city in Poland with 250,000 inhabitants ”



“ We want to educate future generations and prevent them from running away abroad. This is the place where they could find their happiness. Restoring missing bonds within the society is also our goal.”



“ Plans for Nowa Huta are on the paper for too long. ”

Fig. 59. Sketches from interview (own work)

# 11. UTOPIAN CONDITIONS

Series of determinants have been created while investigating characteristic features of Nowa Huta. They are already crucial design decisions and organize imaginary society into separate entity on the map of Europe.

Project will aim to design on the assumption that:

1) Steelworks as the main industry in the area will dissolve into small entrepreneurial workshops producing locally

2) Nowa Huta will be an independent economical zone not only on the scale of Kraków, but also the whole country

3) Social Security will not exist. Every citizen will have its own bank account that he/she saves money on and dispose freely and wisely. The strong catholic community gathered around churches in Nowa Huta will assist voluntary.

4) The index of GDP which focuses on production expressed in money, will be prelated by HDI, that measures human development

5) The post-communist society that is in the majority, will succesfully rearrange itself into civil society that is responsible on the public space.

6) To facilitate the return Poles from exile, make entrepreneurship easier and facilitate circular economy, the income tax will be abolished.

7) EU funds that can be issued on the beautification of public spaces and elevations, will give rise to the circular economy transition

8) Due to lack of resources and initial capital, focusing on the recycling of waste seems to be an adequate starting point for improving the economy in the area



Fig. 59. Graphical presentation of utopian conditions (own work)



## 12. SCOPE OF THE PROJECT

The specificity of the research and design raises questions on many scales. What is the political status of Nowa Huta? What is the relation between Nowa Huta and the rest of the country or Kraków? To place the utopia in a broader context, research on various scales is necessary.

In the national scale (Fig. 60), Nowa Huta becomes an urban laboratory for testing circular economy in practice. Because of the high national waste landfill ratio, the city becomes a waste filter for the rest of the country. On the national scale, the specific policy is needed and planning strategy is needed.

Nowa Huta as the place constructed in the opposition to Kraków still derives its identity from that fact. The utopia assumes that Nowa Huta is planned as the separate entity. On the scale of the administration unit, determining the relation between two urban centers is needed (Fig.61).



Fig.60. Nowa Huta on the national level (Kraków boundary in correct scale). On the largest scale, the area becomes an urban laboratory for experiencing circular economy in practice. source: (own work)

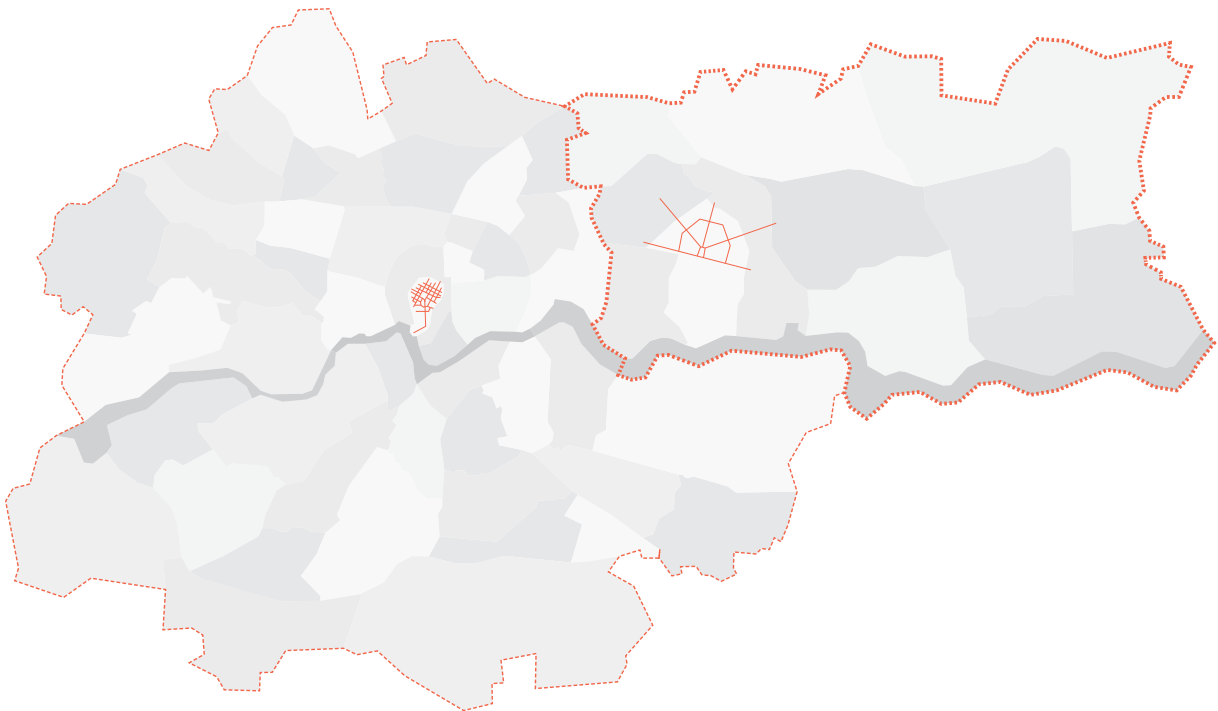


Fig. 61. Nowa Huta on the administrative level. Delimitation of borders, new administration system and sharing some of the public property is needed to consider. (own work)

Nowa Huta as the independent circular system is examined in the city scale. At this level of detail land use and existing level of resource cycling is investigated and the new system proposal taking into account the status quo is created. (Fig. 62)

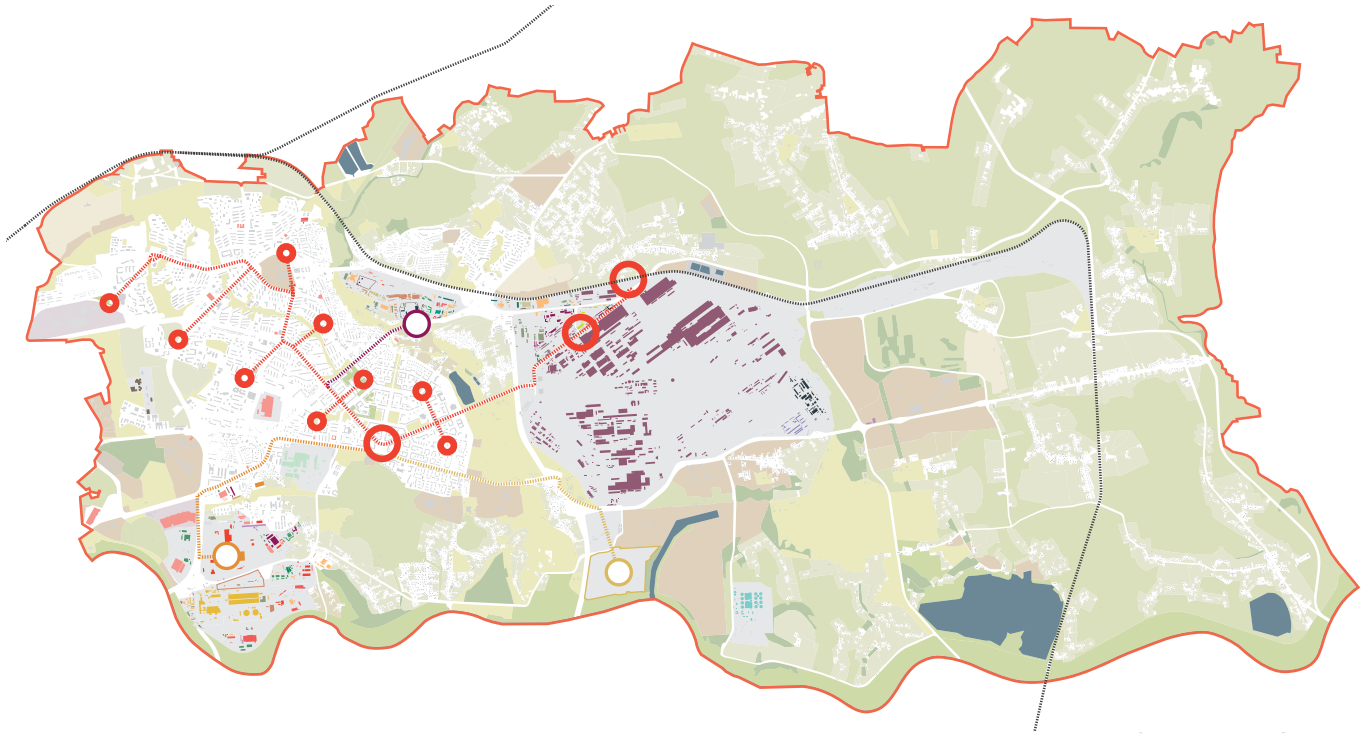


Fig. 62 Nowa Huta in regional scale is considered as a circular urban system (own work)

In a district scale, two instances are being researched. Firstly, the urban blocks consisting of the strategical areas (Central Square, Rose Alley and monumental socrealist buildings with their courtyards) are redesigned in a way that presents the society profiting from resource recycling, up-cycling, reusing and refurbishing. Second part of research and design is based on the industrial area between working steelworks sections such as foundry, cold and hot rolling mill, tubular production and private entrepreneurs continuing post-production of the rough steel components. (Fig. 63)



Fig. 63 Two urban interventions: socrealistic housing and steelworks industry (own work)

# 13. METHODOLOGY

The graph presented below describes the structure of the thesis. It starts with grasping the utopian vision of Nowa Huta in order to follow gradually to probabilistic solution.

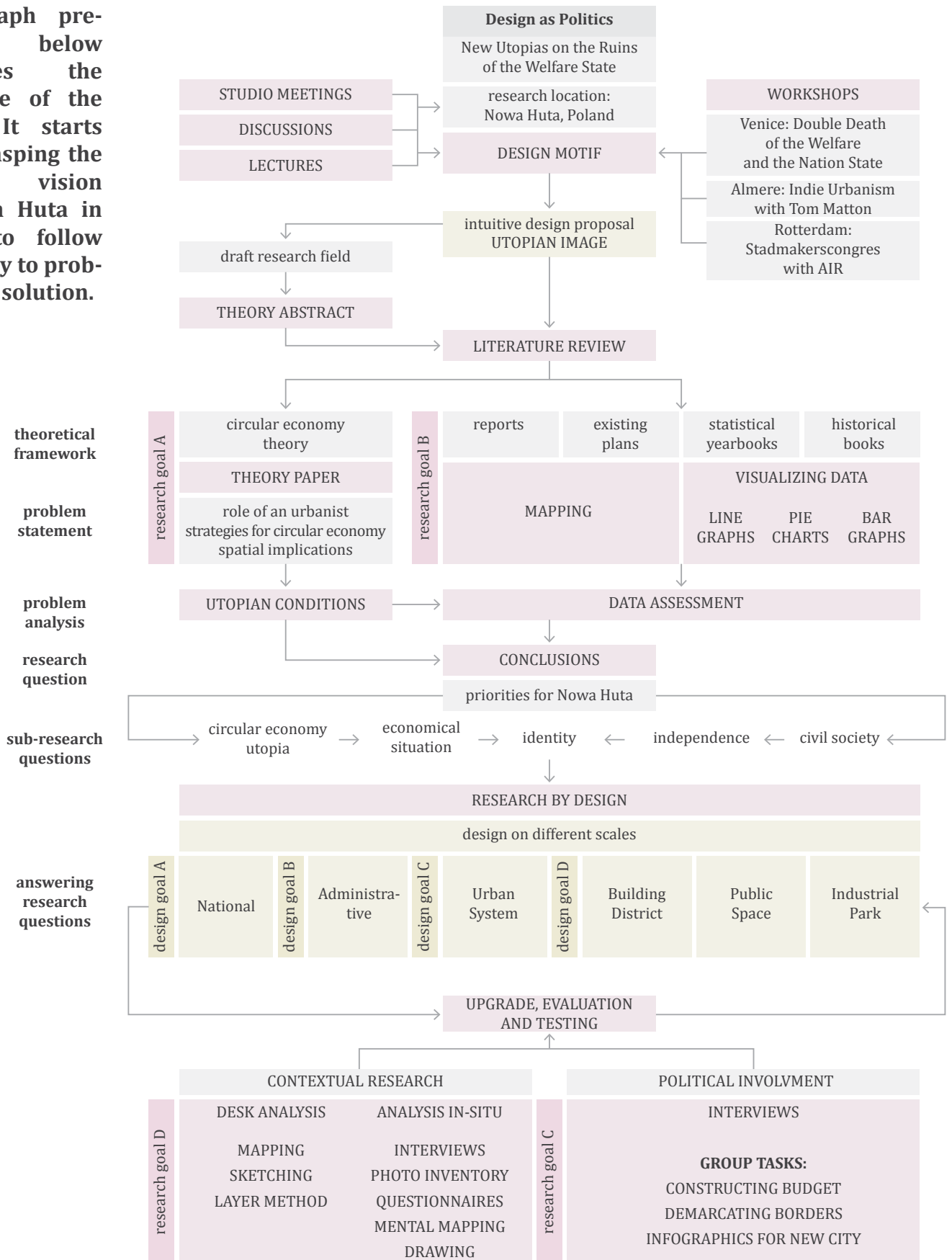
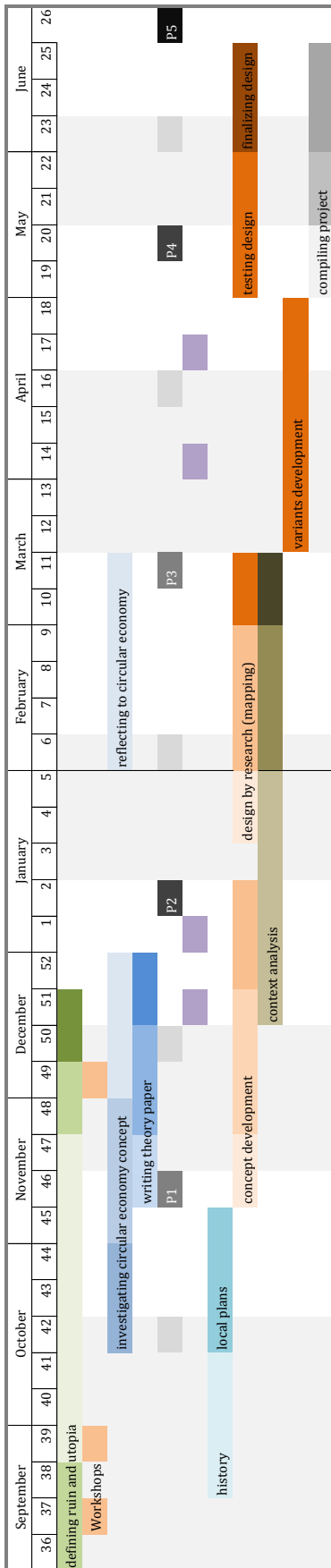


Fig. 63. Methodology Graph (own work)

# 14. TIME PLANNING



Activity log:

- 1) weeks 36-38: definition and preliminary analysis of the Ruin of the Welfare State - Nowa Huta
- 2) week 39: Workshops in Swiss Pavilion at Venice Biennale 2014 “Double Death of the Nation and the Welfare States”; Veneto Autonomy case study
- 3) weeks 40: utopian image + Venice workshops deliverables
- 4) week 41-42: Research on the Ruin of the Welfare State, defining scale and the topic (circular economy), defining details of utopia.

// PINUP PRESENTATION

- 5) weeks 43-46: investigating circular economy concept, reading theory, writing preliminary theory paper, research on solutions in urban planning and design within circular economy, preliminary design for Nowa Huta on the large (city) scale and small scale

// P1 PRESENTATION

- 6) weeks 47-48: investigating circular economy in the history of Nowa Huta, mapping existing industries, research on the local production, its flow and recycling, evaluating local plans for Nowa Huta and investigating on the identity of the place, grasping broader context
- 7) week 49: workshops with AIR in Rotterdam
- 8) week 50: defining conditions for utopian Nowa Huta, designing system of recycling, reuse and upcycling of resources

// PIN-UP PRESENTATION

- 9) week 51: interviews with Paweł Jagło (history of Nowa Huta), Michał Stangel (Nowa Huta of the Future winning proposal), Maciej Twaróg (Magistrat Nowohucki)
- 10) week 52: finishing theory paper
- 11) week 01-02: compiling and analyzing collected data, preparing P2 presentation

// P2 PRESENTATION

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[http://ec.europa.eu/environment/resource\\_efficiency/about/roadmap/index\\_en.htm](http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm)

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<http://ec.europa.eu/environment/circular-economy/>

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## **APPENDIX A: REVIEW PAPER**

# Circularity in urbanism

## How urbanist can facilitate transition towards circular economy

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Theory Paper

November 30th 2014

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**Abstract** - On the 17<sup>th</sup> of December 2012 European Commission has released “Manifesto for a Resource-Efficient Europe”, pointing out the opportunities that comes from adapting “ultimately regenerative circular economy”. Until now, many efforts have been done to move towards absolute waste reduction, but still “the action has to be taken in the next ten years to put Europe on the right track and to speed up the transition.” (European Commission, 2012) . Circular economy is a concept of industrial system that attempts to create a flow of resources, both organic and technological, that supposedly works in closed loops of reuse. The system is restorative and regenerative by design and promotes the multi-cycle flow of resources. Though, the complex redesign of the current infrastructure is needed. (McArthur Foundation, 2014).

The aim of this review paper is to get insight into circular economy concept from the urbanist point of view through identifying planning strategies and design approaches that facilitate the transition. Industrial ecology studies proposes two approaches for an urbanist. A paradigm shift to design for ecological communities rather than for generic society and a toolbox, that can help to rethink urban proposals to work with circularity. (Ferrao and Fernandez, 2013). On the other hand, the transition towards circular economy can be carried by multi-step activity that brings the circularity thinking from niche to mainstream. (IMSA Amsterdam, 2013). Both approaches are tested already while creating strategies for regions (Zhijun, 2007) and cities (Tilie, N., 2014). Even though, transition towards circular economy will create many job and environmental opportunities, it is heavy to achieve in urban proposals since many obstacles that need to be leapfrogged. (European Commission 2014. Ellen McArthur Foundation, 2014. IMSA Amsterdam, 2013).

Taking the challenge provided by the EU, this review paper attempts to answer the question: how the circular economy concept will be evident in urban planning and design and what will be the agenda of an urbanist in the next few years regarding the emergence of circular economy. How urbanists can speed up the transition? What design solutions and strategy proposals will facilitate the process?

**Key words** – circular economy, urban metabolism, resource scarcity, sustainable urbanism, resource management, transition towards sustainability

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### 1. Introduction to the problem

The world of the XXI<sup>st</sup> century, with its finite resources pool, sooner or later will face the problem of energy and goods supply. Trend of growth and expansion started in the XX<sup>th</sup> century has not changed, only moved from developed to developing countries. The

mainstream, linear economy shapes the urban development and the social behaviour. In this model the level of prosperity is measured by GDP index that focuses on the production aspect. It concerns no more “than whether market mechanism can distribute the last unit of resources in the most efficient way” (Pin, Huta, 2007). Even though the supplies of petroleum

and natural gas have already peaked (Pimentel, D. 2008), and agricultural footprint extended the amount of land comparable to the area of Asia (Hamilton, et al., 2014), three billion people are expected to join middle-class consumers before 2030. It will rise the natural resources extraction more than a half comparing to 55 billion tonnes in 2002. (Dobbs, R., 2011) Following this course, the Earth is aiming for rapid resources depletion with unpredictable effects.

On the background of the global resource insufficiency a crucial question arises: “how the urbanism profession can deal with the resource scarcity?”. In contrary to the linear “take-make-dispose” system where materials and energy are widely wasted, stands circular economy. The system is a restorative and regenerative mechanism which treats technological and organic resources separately, resulting in a lack of remaining waste. Keeping resources in constant cycles of production, reuse, refurbishment and recycling helps to protect the environment from being polluted and optimize the use of resources and energy (Ellen McArthur Foundation, 2014). The concept is believed to revolutionize our daily life, but is still not widely applied in urban proposals.

## 2. Circular economy principles

The basic assumption of circular economy is that products needed to be designed in a way to flow in optimised cycles of use and disassembly. That process set them apart from being disposed or recycled in short term. Waste in that sense does not exist, since can be turned into resource. Materials are kept in flow, thus the residual waste is close to zero (European Commission, 2014). Circularity defines strict difference between non-toxic biological commodities that are consumable compared to the durable technological nutrients i.e. electronics or machinery (Fig.1). The energy required to maintain the cycles is from a renewable source. (Ellen McArthur Foundation, 2014). Circular economy replaces the idea of consumer by the notion of a user who can establish closer relation with industries, and through that improve (extend) the life cycle of a product. The major focus points of circular economy (minimizing the use of resources and energy) are achieved through four principles (Ellen McArthur Foundation, 2014):

1) Inner cycle: minimalisation of the material usage

- 2) Cycling longer: products are meant to be reused, remanufactured or recycled more times and longer
- 3) Cascade use: The components of products can be reused in a different way any time the initial product is worn out
- 4) Pure cycles: respecting uncontamination of material flow

The core point of circularity is design. Through standardisation and modularisation, products could avoid being dumped in landfill, being moved between industries. The proper design of products accelerate chain of positive changes. Industries can gain profits from cross-chain collaboration. Eliminating waste and downsizing pollution will affect positively the environment, etc. (Ellen McArthur Foundation 2014)

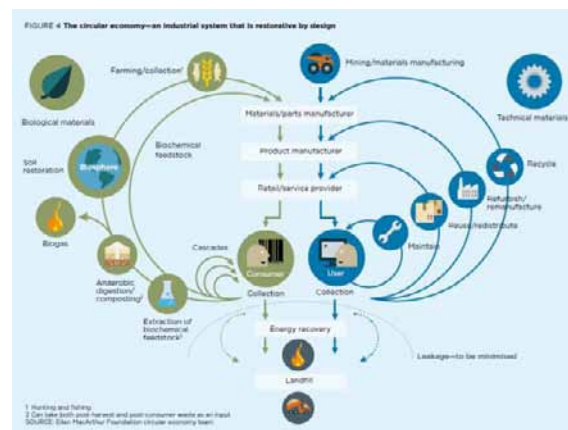


Fig. 1 Circular Economy and its biocycles, technocycles and cascade use (Ellen McArthur Foundation, 2014)

## 3. Different paradigms to achieve circular economy in urbanism

Industrial Ecology Agenda: facilitating sustainable urban systems through circularity and introducing a toolbox for urbanists

Urbanists willing to find the way to implement principles of the circular economy into reality and achieve urban sustainability shall find the feedback in the Industrial Ecology. The system creates an urban development that provides the values of justice and equity to the citizens through the healthy environment of living. In that sense, every action made by the human being concerning creation of an urban fabric has to be assessed in the relation to the environment with the use of available data. Industrial Ecology delivers two main contributions to the circular economy (Ferrao and Fernandez, 2013):



Firstly, the Paradigm Shift, that has to change point of urbanists view towards community, connectedness and cooperation. The realization of autonomous self has to go by the wayside in order to achieve “ecological communities”. The eco-communities stands opposite to “the consumption society, that lacks a principle that is offered by the industrial ecology metaphor, which is the principle of sufficiency” (Ferrao and Fernandez, 2013). The circular economy may create new markets, and patterns that promote sharing, reusing and using instead of owning (European Commission, 2014). The Paradigm Shift brings some patterns that can be promoted in our environment (Ferrao and Fernandez, 2013):

- New customized services and products
- Culturally embeded local jobs
- Creating chain of industries that integrate the residues and end-of-life products between them

Basing on Industrial Ecology studies, European Union already prepared a programma – Resource Efficient Europe 2020, which will facilitate the transition. The agenda coordinates actions across many sectors and introduce policies which will generates jobs through better resource use (European Commission, 2014).

Secondly, Industrial Ecology brings an Ecology Toolbox which helps to redirect the urban development towards better sustainable systems. The toolbox tries to rethink the human developed systems by comparing them to natural systems. In example, the economy, that is driven by money nowadays, shall be driven by solar energy and be focused on resources availability and need to address solidarity or voluntarism. Further, focus on efficiency, consumption and production could be enhanced while focusing on sufficiency. That could be achieved by internalize the limits of growth, developing new business strategies which provides service rather than products. Linear economy should become, like in the nature, more circular and promote reusing, and recycling of products, while material flows shall develop recycling strategies using the cascade use of materials, whereas resources are recycled, reused, upcycled or refurbished (Ferrao and Fernandez, 2013).

#### Circle Economy Agenda: Transition in steps

On the other hand, the Circle Economy Foundation proposes a gradual process with two major phases. The first phase, non-competitive niche in the linear economy model is a phase of testing and research for circular economy. It precedes the second phase – mainstreaming,

whereas circularity becomes a common phenomena. The organization distinguishes 14 steps to facilitate that emergence. (IMSA Amsterdam, 2013):

First of all, an index of performance (1), other than GDP is needed (European Commission, 2014., Zhijun, 2007., Schremer, 2009). Industries, companies, investors and new development shall be granted or fined i.e. by the measure of environmental impact. After that, the experimentation, innovation and new approach toward design shall be introduced (2). Successful products or entrepreneurs who adopt the circular economy idea will be promoted in order to spread the concept (3).



**Fig. 2 Step 2: Experimentation Phase. Villa Welpeloo by 2012 Architects made of recycled textile, wood, flooring and insulation**

Along experimenting and testing, the education and training (4) should be initiated to enlarge the awareness within academas and different businesses. The latter will develop a long-term vision (5) of identifying risks and opportunities streaming from assessing resources characteristics. (Zhijun et al., 2007) proposes similar pilot and demonstration programs, involving vertically – enterprises, industry parks, urban infrastructures, cities and regions, whereas and horizontally – industries, urban infrastructures, cultural environment and social consumption system. The implementation shall be started in the micro level in single enterprises going up to the macro – regions.

Further, exchanging waste (6) (material pooling) shows the opportunity to cooperate between industries rather than compete. Promotion of products made in circular cycles is the next step to achieve circular economy. (7) The companies which stays in linear economy could be introduced to a “roadmap” which helps them to go through transition. (8). Business can redesign wholly the chain of production and distribution. The transition shall be supported by ICT

development and social change (European Commission, 2014). The fora or platforms to exchange experiences are needed (9). Switching to circular economy need attention of different groups of actors and shall be a part of policy-making (European Commission, 2014).

The steps presented above deal with today's status quo. It seems to be adequate for urbanists to follow the experimentation, trainings and education steps, especially when thinking about roadmaps for economic sectors and designing infrastructural systems of material pooling and circular products.

After niche steps are achieved, the governments needs to oversee the companies performance according to the new standards (10), conduct a shift from labour to resources tax (11), change the current economic indicator (12), establish international independent systems for material flows (13) and adjust policies to the new realm (14).

In that phase an urbanist can find his role in being more involved political, especially while creating strategies and policies cities and regions.

#### 4. Urban strategies based on circular economy concept

Circular Economy can be achieved through design of systems, chains and products. Greater cooperation between industries, users and policy-makers; advanced eco-innovation, move from selling products to selling services and developing business models based on leasing, sharing and repairing is also an important factor (European Commission, 2014).

In this realm, IABR-PROJECT ATELIER ROTTERDAM (Tilie, N., 2014) proposes Four strategies to optimize flows in Rotterdam. The atelier aim was to answer the question "how the urban metabolism idea can contribute to increased sustainability in the development of the city."

Regarding the fact that Rotterdam is the main Dutch port, urban planners, find the transportation of goods, raw materials and semi-finished products as one of the most important area of investigation. Therefore, a strategy which deals with that flows shall improve the quality of life and enhance the environment. Two approaches are highlighted to achieve it.

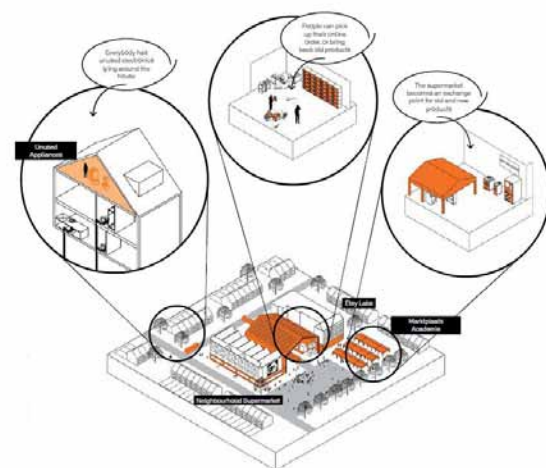
Firstly, using the geographical proximity of material flows an attempt is made to find the synergy between range of flows linked to each other through the spatial design. The second approach focuses on material flows of production and consumption. Planners use circular economy as a guidance to improve the sustainability of the material use in the chain of production and consumption.

Four urban design strategies are proposed (Channeling Energy, Creating Biotopes, Collecting Resources and Catalyzing Re-Industrialization) based on above mentioned approaches. Two of them refers to the circular economy idea.

##### Collecting Resources:

In regional scale: harvesting phosphate in aquafarming; producing medicines, cosmetics and plastic from bio-based nutrients.

In city scale: collecting waste in a way that flows do not mix through easy applications; sustainable renovation instead of building demolition; collecting phosphates from human faeces required for food production; collecting proteins at household scale and using them in urban farming; creating local points (extending functionality of supermarket) for e-waste collection and for servicing daily-use products (Fig.2).



**Fig. 3 Design Application of Circular Economy: Supermarket as the resources exchange place**

##### Catalyzing Re-industrialization:

In regional scale: logical business location for small size manufactures and public transport facilitating mobility of people.

In city scale: creating missing links of transportation for “knowledge” through lightrail; designating development zones for new innovative industries; creating experience centers, expertises offices, new experimental laboratories; filling gaps in the urban fabric with the new forms of manufacturing industry and craft activities; optimizing logistics; reducing motorized freight traffic; cargo-hubs; open-air markets; distribution centers; transfer hubs and pick-up points facilitating transport of people and cargo; Re-Industrializing Boulevards by facilitating appropriate place for small entrepreneurs; The strategy mentions the transition from mass goods production towards local manufacturing. The 3d printing (digital manufacturing), social networking, decreasing cost of transport is treated as a promise for the future; two developments for digital manufacturing shall play the crucial role in the future: digital production of simple consumer items for the local market; high-tech products through cooperation of makers and thinkers, such as RDM Campus.

(Zhijun et al.2007) proposes a strategy model of implementing circular economy rules proposing different levels of application.

- 1) Enterprise level: setting up industrial chains that minimize product use and pollution, maximizing resource usage
- 2) Industry level: waste exchange, clean production, multi-level use of energy, minimize discharge and waste, regional integration, smooth information exchange
- 3) City level: pollution prevention, sustainable social, economic and environmental development

Also the aspects of good legislation process are considered (Zhijun et al.2007):

Coordinating with environmental planning, at various levels with budgetary support; stipulating responsibilities of central and local government; forcing major polluting enterprises to adopt circular practices; encouraging use of less hazardous technologies and rewarding recycling and reuse; networking businesses; giving responsibility of recycling to households; public participation in creating resource-circulating society.

## 5. Obstacles

European Commission is underlining challenges and obstacles that has to be overcome (European Commission, 2014): Companies lack awareness of the circular economy solutions; confidentiality and trust issues blocks share of knowledge. The status quo that we live in, can lock the economy in linear model (powerful stakeholders would rather stay in current economic business); Investment towards eco-efficiency is too risky and too complex. Demand for sustainable products and services is relatively low in European society, price of them does not reflect on environmental impact and finally the voice of politician is not sufficiently strong.

On the other hand Circle Economy sees following obstacles (IMSA Amsterdam, 2013): In financial point of view, major investment cost for companies; externalities (environmental change) is not taken into consideration of new industries, recycling is still more expensive than raw materials extraction, cost of management can be too high whereas quality of recycling materials is low. Considering infrastructure: application of new business models is limited, technologies which are linear are deeply rooted and there is a lack of information exchange system. From socio-political point of view, attention on the end-life of products is very low; separating bio and technical nutrients in households is a challenge, government are supporting linear economy model, circularity is not integrated efficiently and finally, policies on recycling are ineffective.

## 6. Conclusions: What urbanists could do?

EU recognizes opportunities that will bring values while transition is completed: 8% of annual turnover, and reducing greenhouse gas emission up to 4%, 2 million jobs could be created. Moreover, the society is vastly convinced that resource saving will create savings and better living conditions. But how the urbanist can help to achieve that goals?

As described in previous chapters, there are tools already available for urbanists, that can be used to facilitate transition towards circular economy. Firstly, paradigm shift is to be underlined together with the use of industrial ecology toolbox. Secondly, participating in education, trainings, workshops and understanding urban flows in niche phase. Designers are responsible to understand the circular economy concept and

promote it through their design. Regardless the scale of project (from designing 100% recyclable mobile phone, to designing a self-sufficient urban system). Following Sustainable Urban Metabolism in Europe, it is needed to analyze the potential to transform existing urban built environments to minimize resource use by improving urban form (Schremeer, 2009).

Regarding the fact, that the circular economy concept is very hard to implement and propagate, the influence of urbanist and designers in overall in that field can be crucial. "Influencing urban structures and promoting more sustainable forms of behavior, will require more than single policy instruments." (Schremeer, 2009). Urbanists shall consciously participate in policy-making process while circular economy is in mainstream phase.

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## **APPENDIX B: GRADUATION LAB: REPORT FROM WORKSHOP**

## Report from the workshop „Get Inspired by Biennale”

By Tanya Chandra, Martina Gentili, Di Fang, Juste Stefanovic, Sarah Rach & Krzysztof Pydo

*The 14th Architectural Exhibition in Venice Biennale 2014* has become a fairly convenient location for a workshop organized by Msc3 Urbanism students from TU Delft. The major aim of the student workshop organized at the Biennale was to reflect on different forms of representation of various exhibitions located mainly in the Giardini and in the Arsenale. The major task was to analyze how the pavilions and exhibitions attract visitors, what emotions they evoke, what senses are involved in communicating the meaning of display and what is the interaction between installations and users.

The conclusions of the workshop was linked to the *Design as Politics* activities taking place at *Swiss Pavilion*, whereas students were asked to think through and to visualize the independency of Scotland, Veneto and Cataluña. The intention of the exercise was to exaggerate one of the crucial aspects of examined regions in order to create their utopian images. The utopian systems of *Scottish Lottocracy*, *Veneto: Country of Production, Polenta & Palladio* and *School of life* supposed to be finalized with a pavilion design of the newly formed country for the purpose of its first Biennale Exhibition in Venice in 2016.

As a group we defined different manners of involving visitors in an exhibition/pavilion. Involvement can be done in an active way where the visitor takes an active role in viewing the exhibition and needs to take effort to be provided of information or in a passive way where the viewer is more of an observer. Then there is another distinction where the viewer is either a visitor of the pavilion or is experiencing the pavilion. So summerizing there is a distinction between active and passive, and visitor and experience.

In the following the different pavilions as an end product of the *Design as Politics* workshop are presented which were inspired by the different pavilions we visited during the week.

### **The Pavilion of Scotland:** *Martina Gentili*

The recent Scottish referendum was debated not only on the basis of national identity but on notions of justice and equality. These stem not from a regional identity but from disenchantment with dysfunctional democratic processes. Scotland is not unique in this respect but provides a convenient boundary and broad political consensus in which to base a project.

In the Scottish pavilion the future 'lottocratical' Scotland is presented: an independent country in which a series of lotteries have replaced normal systems within society.

The government is elected lottocratically (all citizens may be called upon). The lottery considers the hours of labour, leisure, GDP and housing required towards achieving the governments broad goals and distributes them unevenly, much in the way that resources are distributed unevenly in 2014. Money earned, house, salary and work hours are appointed at random and have no correlation to (eg. thanks to the lottery a butcher, working 3 hours a week, earn £400,000-a-year, living in a caravan in Peebles may find himself in Nairn the day after, a surgeon working 40 hours for £10,000-a-year whilst living in a high-rise). This is a form of fairness in which everything is not equal but in which all citizens will experience all ways of living - it is our contention that empathy arising from this situation would create a better society (would undermine spatial segregation, condemnation of certain housing types, accepted forms of government etc.).

In the course of a week spent in Venice working through the utopia to its absurd conclusion, with its implications for human instinct, self-determination, reproduction, education, law making, immigration etc, we feel that it provides a compelling alternative to the situation in 2014.

The visitors of the Scotland pavilion can experience it in an active way. They will find a lottery machine in the middle of the pavilion to guide them through a personal journey in the life of Lottocratic Scots. Personal paths, determined by the lottery machine, will lead the visitor through a series of images depicting the possible life he or she could have if living in the new independent People's Lottocracy of Scotland.

**The Pavilion of Veneto:** *Tanya Chandra, Sarah Rach & Krzysztof Pydo*

The pavilion of the Veneto region is showing the utopic country of production. The production state of Veneto is aiming an optimized production system in the sense that it should endure as long as possible. In order to create a utopic country of production it runs a cycle of optimal production which tries to reach consensus between using all available resources and exist as long as possible in this state.

The intention of this utopia is to generate a cycle that takes this character but removing the idea of ownership. Everything in it belongs to production. The four quadrants of this system is production, housing, resources and recreation. One is at its peak of production when they use the 24 hours of a day equally for working, sleeping and recreating. The pavilion consists of a conveyer belt which passes by the different quadrants of the production country. At certain times the visitor is forced to get of the belt to either rest or play a mandatory game.

The visitor of the Veneto pavilion experiences the pavilion in an active way. He is forced to participate in mandatory activities (which are a metaphor for the optimized activities in the utopic country of production) and a set time will lead the visitor through the pavilion just like the inhabitant of the Veneto region sleep, works and recreate for exactly 8 hours a day.

**The Pavilion of Cataluña:** *Di Fang & Juste Stefanovic*

For our group work we got inspiration from two pavilions – the Swiss and the French pavilions.

The inspiring part in a French pavilion was the movies, which they were showing. It was easy to understand, but at the same very informative and unique. And what was also important, that it interested a lot of people.

The Swiss pavilion mainly shows works from Cedric Price and Lucius Burckhardt, who were both much concerned with the idea of the present moment, of the need to relate to “now” and chart a future path for their contemporary society. Both Burckhardt and Price critiqued the traditional tertiary education system and were interested in rethinking the basic concept of a university. When we first arrived at Swiss pavilion, we looked at the models in the room and checked the archives, just as normal visitors. Later on, we had our workshop in Swiss pavilion and visitors came and stopped to watch our work. Then our activities became part of the exhibition and our roles changed from passive visitors to active actors.

We were working on a theme of independent Catalonia, where we basically proposed a strategy of a “School of Life”, where people are obliged to learn/produce Catalan culture and production during all their lives, and spread it all over the world. Therefore, the main idea of the pavilion of Catalonia was to create a space for workshops, where people could learn some Catalan culture. This way of exhibition is chosen in the same logics as the whole idea of the Utopia. It is based on learning to publicize Catalan culture. The pavilion is shaped as a circle, on the wall there will be screens showing movies of Catalan culture, which involves visitors in a passive way.

Inspired by our workshop in Swiss pavilion, our Pavilion will also provide workshop for people and make visitors play a more active role. The workshops in the room become performance, people sitting on the stage in the middle become the audience. As people keep coming in and going out, the “actors” and “audience” keep changing all the time, every moment becomes different.

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## **APPENDIX C: GRADUATION ORIENTATION**





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## APPENDIX D: DESIGN PROPOSAL









