




# Blockchain for SWM and Green Cryptocurrencies in the cities

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# Agenda

Introduction

Methodology

Model Analysis and Functional Time

SWW Models in the EU and  
Croatia

WTE efficiency

Nudging in Behavioral Economics





# Can Blockchain Technology be used to increase recycling in cities?

## Introduction

Cryptocurrencies have been introduced to the world of finance as „the decentralized ledger for transactions“, which would then present an improvement over the traditional central bank system and fiat currencies.

# Methodology

A simple way is to convert non-recyclable and non-recycled waste into energy, that can be used to create cryptocurrencies (WTE – to CRYPTO). Those can be used to ‘nudge’ citizens to recycle more.

But can this actually work?

# Production, Capital, or just Behaviour?

TABLE I CIRCULAR ECONOMY – ECONOMIC ACTIVITIES

Activity/ phases	Circular Flow of Capital		
	<i>Monetary</i>	<i>Production</i>	<i>Goods</i>
1	Transformation of monetary capital into production capital ( $N - R < R_s/Sp$ )	Simple reproduction (personal consumption)	Tangible goods $R = R_s + Sp$
2	Production of usable goods, and value added $P + VA$	Extended reproduction	Services
3	Sales of goods on the market – transformation into monetary capital – money ( $N+n$ )	<b>Cryptocurrency (as production)</b>	Intangible goods
4	Cryptocurrency	<b>CHANGE OF BEHAVIOUR</b>	Environment (protection)

Source: Ž Rohatinski, Vrijeme i ekonomija (Time & Economics), 2020, modified by the author

important ways of using blockchain technology have been discovered and are being discovered in all walks of life and human activities, such as even publishing (although mostly directed at authors and their rights, not at publishers as such), notably in the field of energy and power grids[11], and one of important fields where blockchain technology finds its application is also solid waste management.

# CEAP – Circular Economy Action Plan



municipal waste shall be increased to a minimum of 55%, 50% and 65% by weight by 2025, 2030 and 2035, respectively. The new Circular Economy Action Plan (CEAP) aims to halve residual waste by 2030. It warns about building and overcapacity of waste incineration that could hamper the development of the circular economy. The Single Use Plastics Directive will require that plastic-using companies include 25% of recycle PET in new PET bottles.

# The way to get succeed – standing on the shoulders of giants.

Isaac Newton

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# Household solid waste types and models for urban SWM



## Recyclable

Not all recyclable waste is recycled



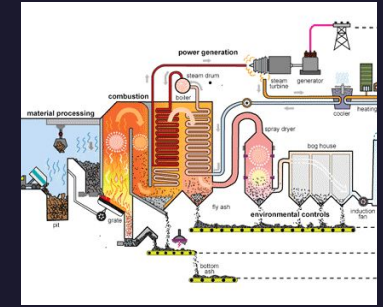
## Non-recycled

Can be recycled if the citizens do their job



## PET

Either recycled or incinerated, citizens can be payed to collect



## Non-recyclable

Incineration



# Gradual transition towards stability

Non-recyclable and non-recycled waste is incinerated in WTE plants and turned into electric energy.

Cryptocurrencies are used to nudge citizens into changing their behavior and to recycle more

Cryptocurrencies are generally highly volatile assets. Linking them to something useful, such as recycling, could stabilize them, and prevent overheating of economy



Energy generated in WTE plants is used to create cryptocurrencies, e.g. green cryptocurrencies, that do not waste a lot of energy

EU objectives of 60% recycled materials are met, as citizens recycle more waste, being nudged by the cryptocurrencies.

# Elements of the New Model

## THE EFFICIENCY OF WTE PLANTS

- The efficiency of WTE plants is only 20-24%,.
- The net electrical efficiency not sufficient to achieve a power to heat ratio of 0,6 or in future 0,65 according to the proposed revision of the EU Waste Directive
- What is feasible is usually harmful.

## NUDGING IN THE BEHAVIORAL ECONOMICS

- Studies have not yet confirmed under which conditions it is effective or what can make it ineffective (or even backfire)
- In Croatia, people can be motivated by nudging or simply by some cash, which can be seen in the case of PET collection.

# SWW in EU and CROATIA



## GERMAN MODEL

- The most successful model
- Appeals to the citizens that are highly aware of ecological risks and dangers
- Citizens are generally motivated to obey EU laws and EU targets, because they feel that EU is useful to them
- Citizens are very law abiding and socially trained to be cooperative
- Germany is among the most economically developed EU countries

## SWISS MODEL

- Polluter pays model
- Citizens are fined for not recycling
- Those that achieve targets generally pay less
- The model is not as efficient as the German model
- It requires law abiding citizens

## NEW PROPOSED MODEL

- Citizens are generally opposed to the EU rules and regulations, which they see as a loss of sovereignty
- Citizens can not be motivated by appealing to them to change their attitudes and behavior purely for moral and ethical reasons.
- Cryptocurrencies are commodities that are regularly traded on the market, although there are no guarantees regarding volatility (risky)
- Citizens could be motivated to change their behavior, even if they do not gain anything in the end, or if the gains are very small.



# Conclusion

From this assessment, we may conclude that there are administrative, as well as economic and logical obstacles to such a proposition, but it does not seem as unrealistic as it may seem. The main problem of low efficiency of electricity generation to produce cryptocurrency can be overcome by **the linking of cryptocurrency to solid waste recycling, which could lead to better circular economy, economic and financial stability, and would even bypass the need for interest rates as a way of slowing down an overheated economy if the volume of cryptocurrency was large.** Instead, the economy would regulate itself, and would also take care of the environment, albeit the growth would appear to be slower, but more sustainable and environment-friendly, which is consistent with the drive for circular economy, that is proclaimed also by the EU documents. Another positive side is also the activation of unemployed or underemployed citizens, and the reduction of the cost for recycling promotion and monitoring, or even fining, as this would be resolved by the positive change in citizens' behavior.

# Thank You

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