

**INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION
ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

**Geneva, Switzerland
18-22 January 2020**

Contribution by Austria

to the CSTD 2020-2021 priority themes on “Using science, technology and innovation to close the gap on Sustainable Development Goal 3 on good health and well-being” and “Harnessing blockchain for sustainable development: prospects and challenges”

DISCLAIMER: The views presented here are the contributors' and do not necessarily reflect the views and position of the United Nations or the United Nations Conference on Trade and Development

Commission on Science and Technology for Development

Input for 2020/2021 Priority Themes by Austria

With thanks to the Federal Ministry for Education, Science and Research (BMBWF) and the Research Institute for Cryptoeconomics & Austrian Blockchain Center for their contributions, Austria submits the following inputs to the Secretariat of the ECOSOC Commission on Science and Technology for Development (CSTD) for the consideration of the priority themes 2020/2021.

ECOSOC Commission on Science and Technology for Development, Request for inputs on the priority themes, October 2020

Theme 1: “Harnessing blockchain for sustainable development: prospects and challenges”

Contact person and expert: Dr. Christian Rammel, Head of the "Regional Centre of Expertise on Education for Sustainable Development Vienna (RCE)"; WU Vienna

Please find attached a White Paper "ESD in the age of digitization", commissioned by the Federal Ministry for Education, Science and Research (BMBWF), written by RCE and headed by Dr. Rammel (Annex 1). The certification and documentation of degrees is identified as an example application area for block chain technology in the educational sector. Data protection requirements could pose a challenge in this context.

Theme 2: “Using science, technology and innovation to close the gap on SDG 3, good health and well-being”

Project on screening for congenital metabolic diseases in newborns at the Medical University of Vienna

The National Austrian Newborn Screening Program for inherited metabolic and endocrine disorders has been implemented in Austria since the late 1960s. It was introduced by the Federal Ministry of Health, the Federal Ministry of Education, Science and Research and the Medical University of Vienna, and it is located at the Department of Pediatrics and Adolescent Medicine. Most children are born healthy, but there are rare congenital diseases, which cannot be detected in newborn infants from external indications. Newborn screening identifies conditions that can affect a child's long-term health or survival.

More than 100 children are identified in the screening program in the first days of life every year. Early detection, diagnosis, and intervention can prevent death or disability and enable children to reach their full potential. In Austria, newborn screening is a collaborative effort between several public health departments and hospitals e.g. in Vienna, Graz, Innsbruck and Salzburg. Newborn screening can save babies' lives and help them begin life healthy.

Case numbers attached (Annex 2).

Potential contact person: Univ. Prof. Dr. Susanne Greber-Platzer, MBA Klinikleitung, Univ. Klinik für Kinder- und Jugendheilkunde, susanne.greber-platzer@meduniwien.ac.at

Covid Schoolproject

An important challenge in the COVID-19 pandemic is managing testing capacities to ensure fast reaction to possible critical development. As an example the Vienna BioCenter, the University of Vienna and the Medical University Vienna are engaged in a joint venture, the Max Perutz Labs, a research and training center where around 500 scientists work on fundamental research in the field of molecular biology. In the wake of the current COVID-crisis, the Max Perutz Labs in cooperation with other Austrian universities are conducting the “Vienna COVID-19 Diagnostics Initiative (VCDI)”. The initiative aims to better understand the role of schools in the COVID-19 pandemic and to provide data for judging the effectiveness of measures implemented at schools to prevent the spread of the virus. Through the use of a new gargle method the local testing capacities will be increased significantly. Based on a successful pilot study, a large-scale sentinel surveillance system is now implemented at Austrian schools for the school year 2020/2021. In total, approximately 14.000 pupils and 1.200 teachers from 250 schools will be invited to participate in the study and will be tested during the school year.

Potential contact person: Univ.-Prof. Mag. Dr. Michael Wagner, Uni. Wien, michael.wagner@univie.ac.at, +43-1-4277-91200

Business card: vCard, Publications: u:cris

<http://www.microbial-ecology.net/wagner>, <https://cmess.univie.ac.at/en/>

Further background information

Theme 2: Project on screening for congenital metabolic diseases in newborns at the Medical University of Vienna

With regard to point 1 of SDG3, there is, among other things, a very long-running and very successful project on screening for congenital metabolic diseases in newborns at the Medical University of Vienna. The difference to other international programs is the Austria-wide registration of newborns (and not only adolescents) and the ongoing development. An expansion of this program is currently under discussion. The funds are provided by the Ministry of Health within the framework of the global budget as a measure of preventive health care at the Medical University of Vienna.

In the performance agreements 2019-2021, the medical universities have agreed to participate in and take into account the projects *Responsible Science and Citizen Science* in their internal training measures, in particular with regard to increased interaction with society. The spectrum ranges from the pollen warning service, the Teddy Bear Hospital to pilot projects with a Citizen Science component supported by the university as part of the start-up support for young scientists. This could also include the *Open Access Initiative* of Austrian universities with the support of the BMBWF (see also FWF).

Scientific research at medical universities also usually takes place in cooperation with non-university research partners as well as national and international partners and companies and scientific societies (e.g. Ludwig Boltzmann Institutes). Examples are the Cooperation Center for Regenerative Medicine between the Medical University of Graz and Joanneum Research. Another example is the "Platform for Personalized Medicine" funded by the BMBWF, which aims to intensify national cooperation in this field and - in line with the ERA Roadmap - to provide a starting point for a wide range of international projects.

Point 2 (SDG3) naturally includes the financing of the universities within the framework of the global budget (especially for academic self-research) as well as research funding.

Source: BMBWF – Abteilungen IV/2, IV/3, IV/5 (09/2020)

Input for CSTD 2020-2021 Priority Themes
Research Institute for Cryptoeconomics & Austrian Blockchain Center

The Austrian Blockchain Center is an interdisciplinary research excellence center which was founded within the framework of COMET (Competence Centers for Excellent Technologies) funded by the Austrian Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation & Technology and the Federal ministry of Digital & Economic Affairs) in 2019. Its mission is to be the one-stop-shop Austrian Research Center for Blockchain (and related) technologies to be applied in industrial applications like industry 4.0 / IoT as well as financial, energy, logistics, government and administrative applications.

The interdisciplinary **Research Institute for Cryptoeconomics** at the Vienna University of Economics and Business was founded in January 2018 and is member of the Austrian Blockchain Center. The aim of this research institute is to coordinate all blockchain and Web3 related research activities in a multi-faceted and interdisciplinary way and to build a competence center that connects researchers with practitioners.

Project 1: Plastic Supply Chain – An Innovative Approach to Offset Plastic (Team of Professor Gerald Reiner, Vienna University of Economics and Business – WU Wien)

Project Partners: Proof of Impact (Iulian Circo), Gregori Consulting (Gerald Gregori), WU Wien (Prof. Reiner, Romana Berariu, Johannes Pulsfort)

Potential Partners: Retailers & Producers Spar, Billa, Hofer, Alpla, Almdudler, Vöslauer, ARA, etc.

Project Outline

This project aims to investigate the **impact of technological and supply chain innovations on the work in process of plastic bottle supply chains** by the shift from a linear to a circular supply chain. It will be investigated further, how a circular supply chain may reduce plastic bottle waste along the relevant supply chain processes, i.e., source, transport, storage, make, deliver, revalorization and return. Blockchain technology enables plastic flow visibility and supply chain data quality as well as data security. This innovative approach allows evaluating the impact of implementation of incentives to obtain higher collection rates, consequently higher recycling rates and increased visibility of the plastic work in process.

Exploring a **pilot program on WU university-campus** that would create incentives for individuals and/or organizations to clean up plastic within the WU campus itself. The objective of this initiative is to close the plastic circle end-to end – from retail all the way to reuse/ recycle / production. This project proposes that the plastic be traced individually; meaning that the individual journey of each PET bottle can be traced end-to end.

The proposed framework allows assessing the impact of implementation of **incentives to obtain higher collection rates, and consequently higher recycling rates** by analyzing the effect of blockchain technology adoption with SD on the circular plastic supply chain. Hence, this project contributes to the **UN Sustainable Development Goal #12**, by fostering sustainable consumption patterns. The framework may be used to evaluate further related innovations, e.g., (1) price sensitivity of raw material (e.g. oil price), (2) financial supply chain processes of alternative raw materials, (3) response to EU regulative for plastic collection rate, (4) usage of recycled material for upcycling or down cycling, (5) incentive mechanisms which influence collection rate (social points and plastic for public transport), (6) material supply and flow simulation through optimal plastic supply chain management, (7) “KANBAN” system which enables closed loop plastic supply chain.

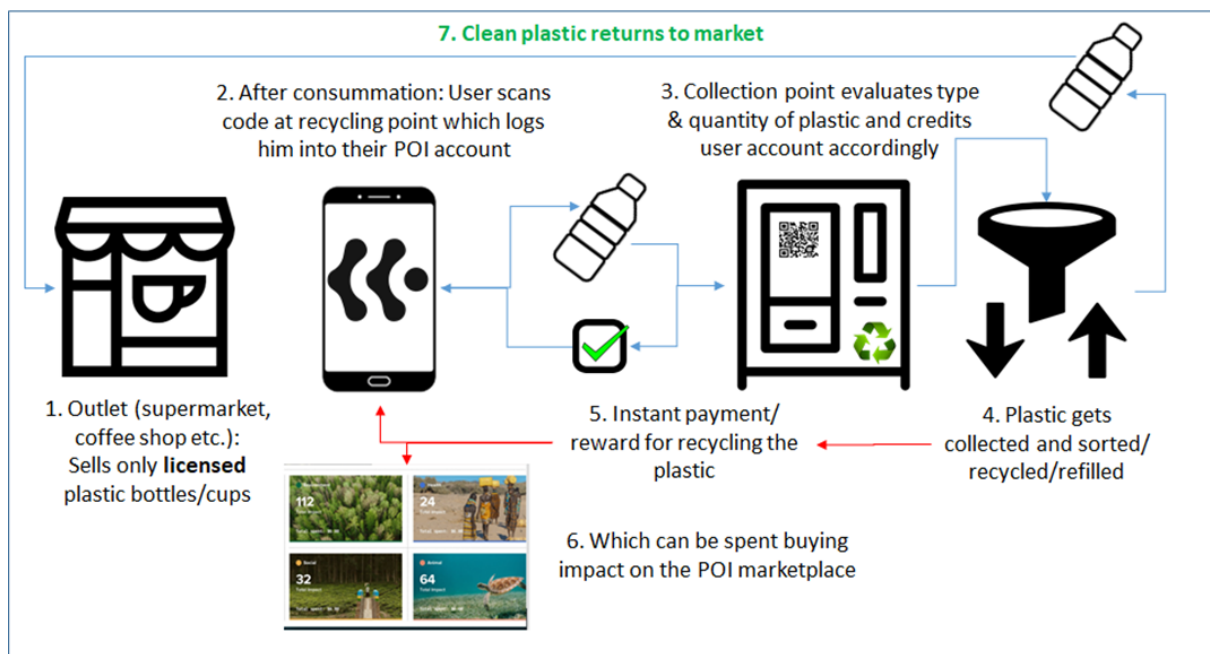


Figure 1: Possible circular plastic bottle supply chain.

Project 2: Kultur-Token: Digital pilot- and research project to incentivize climate-friendly mobility choices in Vienna

Project Partners: City of Vienna

Participating Cultural Institutions during pilot phase: Vienna Concert house (Wiener Konzerthaus), Museums in Vienna (Kunsthalle, Volkstheater, Wien Museum)

Project Outline

The development of the world's first **Kultur-Token app (KT)** and pilot phase:

The KT is a governmentally owned app, developed without a profit motive. The KT's primary goal is to **incentivize citizens of the City of Vienna, Austria, towards sustainable mobility behaviors that reduce greenhouse gas emissions associated with cars**. The KT belongs to an emerging class of apps that are designed to change human behaviors to accelerate transition to an economy that consumes less materials and energy.

After creating a personal user account on their phones, the KT app allows users to **track their own mobility behaviors and be rewarded for low-carbon choices**. Four different transport modes are tracked: car; bicycle/scooter; walking; and public transport. Anytime a user travels by bicycle or scooter, walking or public transport, (s)he is rewarded points toward a "Kultur-Token" (KT). One KT is exchangeable in the app's marketplace for one ticket to various cultural events and venues in Vienna.

The KT uses a Proof of Authority (**PoA blockchain**) technology, which is an adaptation of Ethereum blockchain. This is a **less energy intensive option** than the traditional Proof of Work (PoW) technology. The KT's PoA based **energy consumption is not expected to be higher than the consumption of a traditional database**. However, these data (the use of energy to operate and maintain the blockchain and the app) are not yet available. Better estimates of environmental benefits and impacts are needed to portray the life cycle costs of the KT app and its use more accurately. Arguably, if the app functions as intended, the CO₂ emissions resulting from the app's energy use are likely to be a tiny fraction of the transportation-related CO₂ emissions it helps users abate.

In alignment with the Smart City plan, the KT contributes to digital innovation, using blockchain technology to achieve socio-environmental benefits for the citizens. The Executive City Councilor for Cultural Affairs indicated the project as an example of "digital humanism". Therefore, the KT contributes towards the social goal of diffusing new technologies and digitalization and to make Vienna a digital pioneer. The KT is contributing to macro level sustainability goals too. SDG 11, SDG 12, and SDG 13 are the most relevant.

The Kultur-Token aligns with several SDG Goals:

- SDG 3: Good Health and Well-being; SDG 6: Clean Water and Sanitation; SDG GOAL 7: Affordable and Clean Energy
- SDG 8: Decent Work and Economic Growth
- SDG 11: Sustainable Cities and Communities
- SDG 12: Responsible Consumption and Production
- SDG 13: Climate Action

The development of the app started in 2019. The pilot of 1,000 users was launched on February 26, 2020; however, due to the Corona virus crisis, the pilot was halted in mid-March 2020. The project will resume in May 2021, with enhanced app software.

The app' user interface consists of 4 screens:

<p>1st app page: User's mobility behavior</p>	<p>2nd app page: Kultur-Token</p>



3rd app page: Earned Kultur-Token



4th app page: The app's market place

Website : <https://digitales.wien.gv.at/site/projekt/kultur-token/>

Contact person: Prof. Taudes, taudes@wu.ac.at