IO1: State-of-the-art analysis
Out of the Box International

BELGIUM

1. Introduction

In the present desk-research, experts of Out of the Box International provide a comprehensive insight into the functioning of the Belgium educational system and its links with circular economy initiatives for learning and training opportunities. In this regard, the education system among three communities, the legal framework and management practices, examples for good practice both form education and also form the field of business, education and other sectors have been highlighted to be a source for further stages of the project outputs.

Belgium (the Kingdom of Belgium) is located in Western Europe and it is well known as the headquarters of the NATO and the European Union. It is also distinguished by its characteristic regions including Dutch-speaking Flanders to the north, French-speaking Wallonia to the south and a German-speaking community to the east.

General School System
The education system is divided into four general parts: preschool education for ages 2.5 to 6, primary education for ages 6 to 12, secondary education for ages 12 to 18, and tertiary education in both university and non university format averaging four years. Belgium is divided into three main language communities: Dutch-speaking, French-speaking, and German-speaking.

Every community has unique regulations in regard to the education system and enrollment in schools. In nature, although some aspects differ, the compulsory age for school in overall Belgium is between 6 and 18. Detailed information with the insights of the three community education system can be found below:

-Education in the Flemish Community of Belgium
Vlaams Ministerie van Onderwijs en Vorming
http://www.ond.vlaanderen.be/obpwo/links/

-Education in the French Community of Belgium
Administration Générale de l'Enseignement:
http://enseignement.be/index.php

-Education in the German-speaking Community of Belgium
Das Bildungsportal der Deutschsprachigen Gemeinschaft
www.ostbelgienbildung.be

In short, the stages of the Education System are divided into the following periods:
-primary school: 6 years
-lower grade secondary school: 2 years
-upper grade secondary school: 4 years / vocational school 4 years.

VET and Higher Education Qualifications

In Belgium, men are more likely to pursue a vocational path than women. In 2019, 52% of upper secondary vocational graduates were men. Moreover, 56% of 25-34 year-old women had a tertiary qualification in 2020, compared to 41% of their male peers.

-Belgium (French Community) Dual Vocational Education: Students must attend full time compulsory education until the age of 15. From 15 onwards students may engage in part-time schooling; therefore a structured learning path that combines part-time vocational education in an educational institution with part-time employment follows. On the other hand, higher education programs in the French Community use the credit system based on ECTS (European Credit Transfer System), with a set of teaching units for a total of 60 credits, instead of the traditional system based on years.

-Belgium (Flemish Community) Dual Vocational Education: Students' dual learning can only be accessed from the moment that a learner has complied with partial compulsory education (at the age of 15 to 16 years), and is legally allowed to work. Higher education also uses ECTS instead of years: based on ECTS 60 credits.

-Belgium (German-speaking Community): Apprenticeship and part-time vocational secondary education can only be accessed from the moment that a student has complied with partial compulsory education (at the age of 15 to 16 years), and is legally allowed to work. Part-time vocational secondary education is organised annually through the scope of 50 minute-long 600 lessons, spread over the span of at least 20 weeks. Higher education programs in the German-speaking Community use a credit system based on ECTS 60 credits a year. [1]

2. Legal framework

Belgium is heading towards building a more sustainable society through a circular economy. The federal government and the three autonomous regions: Brussels-Capital, Wallonia and Flander are acting in this unique and joint effort under the main coordination of the Ministry of Environment, Energy and Sustainable Development and Ministry for Climate Transition. Recent developments can be noted starting in 2018, with Belgium having completed and transmitted to the European Commission its National Energy and Climate plan (NECP) describing the Belgian objectives and policies as regards greenhouse gas emissions, renewable energy and energy efficiency in 2030. As one of the main bodies Belgium's Federal Institute for Sustainable Development is also actively working on integrating the circular economy principles into public procurement. There is a lot of collaboration with regional authorities as well as with European and international authorities to move towards the provision of more circular economy-friendly services. Some remarkable developments showcasing best practices in CE in Belgium are the following:

- In 2016, Brussels' regional government adopted a circular economy regional plan "Be Circular" with 111 measures setting out a strategy to transition from a linear to a circular economy by 2025.[2]
- In 2017 Wallonia was selected among 6 European regions to participate in the Pilot Project on Industrial Transition led by the European Commission for the period 2021-2027.

[1] https://gpseducation.oecd.org/CountryProfile?primaryCountry=BEL&treshold=10&topic=EO
[2] BCR, ProgrammeRégionalenEconomieCirculaire, March 2016 and BCR, Programme National de Réforme, April 2016, pp.55; 66-67

-In 2018, the Flemish government approved a draft of the Flemish energy plan and a draft of the Flemish climate policy plan 2021-2030. By implementing this climate plan, Flanders aims to achieve a 35% reduction in greenhouse gas emissions in the non-ETS sectors by 2030 compared to 2005.[3]

3. Main goals and methodology

Main goals of the field research are the following
-To identify the present situation in your country related to circular economy in entrepreneurship programmes and their educational offers
-To review the training offers for youth and define the integration of circular economy into entrepreneurship programmes
-To identify competences and best practices in entrepreneurship programmes
-To identify patterns, gaps and opportunities in the mentioned field

Methodology of the field research
Pre-writing desk research for preparing the state of art following target group have been defined as follows:
-Review at least 5 educational entrepreneurship oriented offers for youth in secondary schools
-Review at least 5 educational entrepreneurship oriented offers for youth at VET level
-Review at least 5 educational entrepreneurship oriented offers for youth at the university level
The total number of interviews among youth and youth groups is 15 youngsters.
The total number of interviews among experts is 5 education experts within CE and beyond.

Preparation of the main content the state of art
- The implemented 15 interviews with youth and 5 with experts served for gathering master data for further contribution to the appropriate approach for learning and education modules for young green entrepreneurs, as well as developing content for the e-learning platform and following intellectual outputs of the CI-YOU project and its wider impact.

This detailed learning model development approach leads to the identification of the competencies, related to the Circular economy principles and entrepreneurship, as well as to the identification of gaps and opportunities. Education programmes and offers are consulted and documented. Furthermore, information is collectively analyzed and compared where possible, and constitutes a 'state of the art' in its own right, although differences in policy priority necessarily lead to some variation within national reporting. For this purpose, legal documents such as strategies were read and compared, and the results of the research conducted as the main objective of the report was to compare secondary, tertiary and VET educational offerings in the Circular economy and related entrepreneurship offers.

4. Educational offers

In this chapter innovative approaches at educational institutions as well as opportunities for studying in CE related paths will be given with the selected examples from Belgium.

Secondary School CE Experiential Learning:
Includes educational Games in Secondary Education to Introduce Circular Economy:

[3] www.greendeals.be

-CE Experiences With the Game EcoCEO
Strategy Planning - business strategy with local investment - Competence gained |CREATING
Worker Placement - Turn taking available company activities - Competence gained | EVALUATING
Action Points - Invest, Assign workers, Sell products - Competence gained | ANALYZING
Resource Management - Limited amount of resource cards - Competence gained | ANALYZING
Rewards - Penalties - Logical local investments - Competence gained | ANALYZING
Feedback - Feedback on business strategies - Competence gained | ANALYZING
Card drawing - Cards mining as resource and investment opportunity - Competence gained | APPLYING
Victory Points - Investments made and determining winners - Competence gained | APPLYING
Role play - Students are acting as CEO of an company - Competence gained | UNDERSTANDING

-Linear Economy Principles
Mining of virgin sources - Drawing source cards
Production - Producing microchips, e-bikes, other with the cards in hand
Product sales - Selling products developed above
Resource efficiency - Producing products with one resource less
Resource substitution - Replacing one resource for another when producing

- Circular Economy Principles
Waste recycling - reclaiming cards from central resource for waste pile
Take back and sell for scrap - taking back microchips/e-bikes from central market and sell to waste pile
Microchip reuse - Reusing microchip from products taken back
Renting service - Renting out products instead of selling them
Design for repair - Allowing rented out products to be repaired and continue collecting credits

Educational institution	School 1	School 2	School 3
Study programme	Business economics	Business economics	Mixed group (seminar circular economy)
Grade	5th year	6th year	5th and 6th year
Number of students	16	12	14
Instruction	Instruction videos Co-teaching with 2 teachers	Instruction videos and an instruction-PowerPoint No co-teaching	Instruction videos and an instruction-PowerPoint No co-teaching
Type of data collection	Reflection report based on guiding questions	Reflection report based on two open questions	Reflection report based on two open questions
Grading of the report	Graded	Not graded	Not graded

Higher Education Programme opportunities in Belgium with reference to CE are listed as examples:

-Advanced Master of Globalisation and Development (University of Antwerp)
-International Master of Science in Sustainable and Innovative Natural Resource Management (Ghent University)
-Master of Human Settlements (KU Leuven)
-SINReM – International Master of Science in Sustainable and Innovative Natural Resource Management (EIT RawMaterials Academy Ghent)
-SUMA – Master in Sustainable Materials (EIT RawMaterials Academy Ghent)

-Advanced Master in Water Sustainability: Integrating Technology and Nature-Based Solutions (University of Antwerp)

Job skills transition

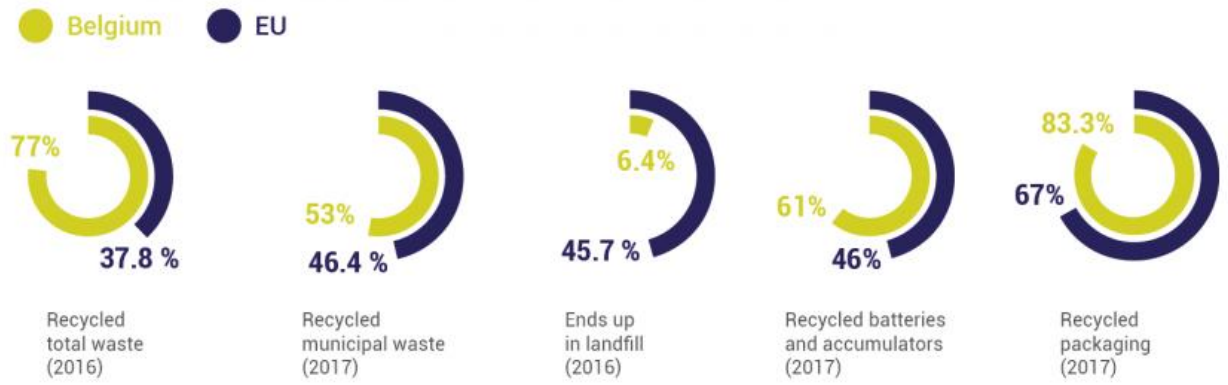
UCM-Union des Classes Moyennes (Brussels) and MAD-Mode design centre Brussels are developing initiatives to ensure the transmission of eco-design and eco-functionality tools to higher education institutions to public training providers to enable integration into course curricula.

5. Circular economy management practices

Various examples under the framework of CE management and implementation practices are listed below which will also inspire other partner countries with the level and comprehensive approach in Belgium.

Towards zero waste

One of the aims of the circular economy model is zero waste, where all materials are kept in circulation. In 2016, Belgium ranked as number two in the European Union in recycling waste; almost 77 per cent of the total waste in Belgium was recycled (Eurostat).



Circular construction

In 2019, Flanders launched the Green Deal on Buildings and Construction, through which construction companies, building material producers, local and regional authorities, private builders, researchers and other organizations work together to make circular construction a daily reality. As an example of actions taken in Wallonia, concrete and bricks from demolished buildings are being turned into eco-friendly road surfaces in the province of Namur.

Sustainable eating

Cities have become increasingly important in reducing the emissions associated with food production and food waste, while making sure their population has secure access to sustainable, healthy and affordable food. Thanks to suburban farmers' markets and a new logistics platform for professional buyers, local food is now booming. Surplus food has been distributed to people in need, which simultaneously alleviates poverty and reduces CO2 emissions. Flanders has also tracked its food waste since 2015, and initiated a Food Supply Chain Roadmap on Food Loss — a public-private partnership to reduce food losses by 15 per cent by 2020 relative to the baseline — while in Wallonia, an action plan

focused on tackling food waste aims at reducing losses and waste at all levels of the food chain by 30 per cent between 2015 and 2025.

6. Good practices

As Belgium is a leading country in CE initiatives, below is an outline of of innovative examples from the different dimensions of the CE framework definition and support to the public and private sectors.

The Flanders Materials Programme (FMP)

In order to develop the foundations for a circular economy by 2020, the FMP focuses on closing materials cycles among economic clusters and providing enabling functions. Economic clusters are chosen for their potential for improvement from a primary resources and materials' perspective and for the expertise in these domains present in Flanders. They include:

- Sustainable materials management in construction
-Bio-economy
-Sustainable chemistry and plastics
-Critical metals in a continuous cycle.

Enablers were chosen to break down obstacles encountered by every project, business case and innovation. They include:

-Sustainable design
-Smart collaboration
-Smart investments
-New materials and new material technologies and
-Better regulation.[4]

Educational purposes, knowledge transfer, R&D

A Pilot Project on Industrial Transition (Wallonia, 2017) is being carried out in a logic of "peer learning" as a reflection on the stakes of industrial transition and the answers to be brought there, in the context of the regional strategies of smart specialisation. The region of Wallonia was selected among 6 other European Regions to participate in the project led by the European Commission for the period 2021-2027.

Business incubation/accelerations

Reversse Metallurgy (Wallonia) is a platform gathering many investments in the metallurgy sector, encouraging the recovery of scarce metal and participating in the development of a more circular economy in this sector. *Circular economy and waste treatment of metal: hydrometallurgical production, treatment of waste residues from scrap metal, recovery of metallic materials, etc.*

Eco-innovation challenges, prizes, awards

Platform for an Industrial Transition, (Wallonia, 2019) – Citizens and businesses were invited to submit project proposals for the establishment of a circular model of the plastic industry, with a budget of 10

[4] https://ellenmacarthurfoundation.org/circular-examples/belgium-flanders-materials-programme

million Euros. Co-financed by the ERDF and the Wallonia region, the initiative focuses mainly on *research on plastic recycling, waste treatment, R&D.*

Training for companies, consumers

Greenskills - A training program for businesses, as well as for universities, research centres and government agencies. *Eco-innovation, life-cycle analysis, sustainable chemistry, waste recovery, and optimisation of energy performance.*

Clusters, networks, platforms (e.g. industrial symbiosis platforms)

Circular Flanders (2017) Greenwin - A space for networking and building public private partnerships in the circular economy. *Policy research, circular city, circular entrepreneurship, social innovation (production and consumption)*

Dedicated support to new research infrastructure (piloting facilities)

Vanguard Initiative (Wallonia) Interregional is a collaboration partnership made to conduct research on bio-economy and raw material circularity in Wallonia selected by the European Commission to lead this initiative *Innovation*

7. Conclusions

Following the above mentioned framework and the insights with selected examples, the state of art report identifies the challenges and potentials in Belgium regarding the development of a comprehensive understanding and implementation of CE strategies and programmes.

Challenges

Comprehensive stakeholder analysis in Belgium has identified a few main points related to the political organisation of regions and the circular economy innovation initiatives:

-Circular economy initiatives in Belgium as a federal state havie difficulties in functioning at administration level (federal, regional, local). Therefore, major challenges for integrated planning, coordination and decision making are observed.

-Initiatives relevant to the circular economy in Belgium are mostly limited to a regional scale and not much attention is given to the dissemination of positive practice at national level, nor is cooperation in this area seen as a priority aspect.

-The focus on the circular economy continues to grow in popularity in Belgium. Having few natural resources, Belgium depends on substantial imports of raw materials and energy. This factor is one of the main challenges for Belgium to realise its highest potential.

-Lack of eco-innovation and circular economy related skills in SMEs can slow down the operational implementation of good practices.

-Most of the products entering the Belgian market are designed abroad, with limited control over their design apart from purchasing decisions.

-Belgium has a major focus on collecting waste separately and recycling wastes. However, the market for recycled products is still limited and needs to grow to provide economic opportunities for such products.

Potentials

Belgium enhances the circular economy initiatives through research and development with the support of political and economic institutions. The following trends are worth mentioning as potential strengths for Belgium:

-Among authorities and institutions in Belgium, there is an emerging trend towards a more holistic approach to environmental problems, making a link between different challenges (mobility, energy, housing, circular economy, climate change, etc.).

-Internal as well as international demand for cleaner, green products and services has seen an increase in the last decade.

-Belgium has a strong pool of innovative companies, universities, research labs, and well trained human capital (R&D personnel, engineers and entrepreneurs).

-Belgium has strong support from institutions and some of them are dedicated to a sustainable and circular economy that is a key competitive advantage in creating new circular value chains.

-The entrepreneurial environment is relatively strong and in constant evolution. There are several research and innovation clusters in the three regions that enhance the development of new ideas and encourage entrepreneurship (i.e. Wallonia).

External links for further reading:

http://economie.wallonie.be/content/projet-pilote-sur-la-transition-industrielle-plusieurs-rapports-publiés
https://www.greenwin.be/fr/
http://vlaanderen-circulair.be./nl/doeners-in-vlaanderen
https://be.brussels/files-fr/a-propos-de-la-region/competences-regionales/declaration-de-politique-generale-18-7-2019
http://www.environnement.brussels/thematiques/dechets-ressources/action-de-laregion/Plan-dechets
http://www.greentechbrussels.be/en/component/k2/item/227/227
http://www.brusselswastenetwork.eu/
http://www.innovationdata.be/i/LFSI_UNEMP/Unemployment-rate
http://statistics.brussels/themes/economy#.W8zHvBNKj_Q
http://resilientweb.eu/en/
http://irisphere.be/fr#synergy
https://environnement.brussels/sites/default/files/rbc_ges_1990-2016_sub2018.xlsx
http://statistics.brussels/themes/environment-and-energy#.W8y_zBNKj_Q
https://www.colruytgroup.com/wps/portal/cg/en/home/stories/3-vragen-green-deal-circulair-bouwen/3-questions-greendeal-circular-construction