





	Virtual 3-day summer school					
Day 1 - Tuesday 25 May, 14:00-17:30 CET						
Introduction to bioeconomy and overview bioecon	omy educational resources developed by BE-Rural					
Dr Elsa João (University of Strathclyde), with the support of N	leli Georgieva (European Policies Research Centre)					
Day 2 - Tuesday 1 June, 14:00-17:30 CET						
Bioeconomy of different sectors (e.g. fisheries, at teaching in schools in Bulgaria, Latvia, North Mac Dr Flsa João (University of Strathclyde), with the support of	griculture) and how best to integrate bioeconomy cedonia, Poland and Romania.					
Day 3 - Tuesday 8 June, 14:00-17:30 CET						
Developing the industrial biotechnologists of the futur Biotechnology Innovation Centre) with Scottish schoo	e: the innovative work of IBioIC (Industrial Is.					
Chair: Rachel Moir (Skills Erogramme Manager, IBioIC), with the support of Dr Elsa João (University of Strathclyde)						
Day 1 and Day 2 slide https://be-rural.eu/events	s are in links in here: s/teachers-summer-school/					







- A							Summer Sch	ool Attendees
10 10 10 10 10 10 10 10 10 10	4 Latvia Total	4 Poland Key Be	7 Macedonia e-Rural Coun 4 people	14 Bulgaria tries and c	235 Romania sthers tered!	30 Other	2. What kind of teacher are you Pre-school teacher Primary school teacher Secondary (high-school) teacher University lecturer I am not a teacher (Poll result at the start	? (4) 4% (10) 11% (50) 53% (8) 8% (23) 24% t of day 1; n = 95)
							People who are not teachers advisers to Ministry of Agricult bioeconomy policy experts.	inclu ded researchers, ure, PhD stu den ts, an d

	Results	of the	polls at	the s	tart of	Day 1 (1	n = 95):	
3. Have you hea Sustainable Dev	ard of the United Nation velopment Goals (SDGs	s)?	5. How much do you economy?	a know about the c	ircular	6. How much do	you know about the bi	oeconomy?
/es	<u>58</u> %	(55) 58%	Nothing		(12) 13%	Nothing		(5) 5
ło	42%	(40) 42%	Very Little	78%	(12) 13%	Very Little	75%	(21) 22
			Aitte		(49) 52%	Alittle		(45) 4
. How much do	you know about sustair	ability?	Alot		(20) 21%	Alot		(22) 2
othing		(1) 1%	Very much	22%	(2) 2%		25%	
ery Little	59%	(17) 18%	•			Very much		(2) :
littie		(38) 40%	• Day 1	wecovere	ed key prin	ciples of bio	beconomy,	
			er reterin.	مماناته م	d CDCa			















Day 2 outline programme

- Summary of Day 1 of the Summer School More about the BE-Rural Project and the different we Keyprinciples of circular economy

- -17:15 CET (2.45-415 pm UK time) onnecting student learning with industry projects, lessons from Strathclyde oved ways to maximise potential of bioeconomy of different sectors oriskhop on texhing bioeconomy in each of the five innovation regions, ouped by country and language
- Short poll about Day 2 of the summer school Q&A, summary day 2, and link to day 3







- AL	About the BE-Rural Project					
(BE-Ryral	Home About BE-Rural Bioeconomy Innovation Regions News Resources Events Contact 🗚 🦅 f in 🛞					
	DELIVERABLE					
	Deliverable 1.1: Abhold K., Gerdes H., Kiresiewa Z., Davies S. (2019): Sustainability and Participation in the Bioeconomy: A Conceptual Framework for BE-Rural.					
	Deliverable 2.1: Colmorgen, F., Khawaja, C. (2019): Small-scale technology options for regional bioeconomies. Small-scale technology options for regional bioeconomies.					
	Deliverable 2.2: Anzaldas, G., Abhold, K., Araujo, A., Chebotarev, A., Cosnita, D., Diaconescu, T., Dimou, L., Duic, N., Iorgulescu, R., Kinesiewa, Z., Lazdina, D., Matovskis, K., Markovska, M., Mihajloska, E., Mydlowski, A., Panara, C., Pantova, I., Rakovski, M., Schock, M., Szulecka, O., Tolitzach, J., Zelijadt, E. (2019): The macro-environment surrounding: B. Benalty Open Instantion Flatforma.					
	Deliverable 2.3: Khawaja, C, Colmorgen, F., Rutz, D. (2019): The bioeconomy potential of BE-Rural's OIP regions.					
	Deliverable 2.4: Colmorgen, F., Khawaja, C. (2019): Business models for regional bloeconomies.					
	Deliverable 2.5: Colmorgen, F., Knawaja, C., Rutz, D., (2020): Handbook on regional and local bio-based economies. >> Also available in Bulgarian, Latvian, Macedonian, Polish, Romanian and German.					
	Deliverable 3.1: Griestop L, Mannhardt B. (2019): Briefing Paper: Concept for a pop-up store with bio-based products and participatory events.					
	Deliverable 3.2: João, E. (2020). Educational materials on sustainability, circular economy and bioeconomy for schools, colleges and universities. >> Also available in Bulgarian, Romanian, Macedonian, Polish, and Latvian.					
	Deliverable 4.1: Davies, S., Kah, S. (2019): Briefing paper: Knowledge exchange and capacity building for the bioeconomy in rural areas.					
	Deliverable 5.1: Anzaldúa, G., Araujo, A., Tarpey, J., (2020): Briefing paper: Analysing market conditions and designing business models within BE-Rural's OIPs					
	https://be-rural.eu/resources/					









https://be-rural.eu	Day 2 outline programme 14:00 -15:30 CET (1-2:30pm UK time) Welcome back from Dr Bsaloão and the University of Strathclyde Introduction to Day 2 of the Summer School summary of Day 1 of the Summer School Moreabout the BSE.Nural Project and the different working packages Keyprinciples of circular economy
	Break (15:30 - 15:45 CET) (2:30-2:45 pm UK time) 15:45 - 17:15 CET (2:45-415 pm UK time) • Connecting student learning with industry projects, lessons from Strathclyde • Novel ways to maximise potential of bioeconomy of different sectors • Workshop on teaching bioeconomy in each of the five innovation regions, grouped by country and language
	17:15 – 17:30 CET (4.15-430 pm UK time) • Short poli about Day 2 of thesummer school • Q&A, summary day 2, and link to day 3





















































CE Class at Strathelyde

Class "Circular Economy and Transformations towards Sustainability"

- Created by Dr Elsa João, from Department of Civil & Environmental Engineering at the University of Strathclyde, in 2016.
- Class is open all all MSc and MEng students at Strathclyde for all departments, but could easily be adapted to be delivered to undergraduate students or high school students.
- Each weekly two-hour session is a mixture of lecture and workshop/case studies to make class as practical as possible. Class runs over 10 weeks (but as part of an existing class 1-2 hour overview may be enough).
- Class runs collaboratively with other academic staff, including from other departments (7 contribute). And, critically, is rich in industry contacts input (11 contribute).

Class includes bioeconomy.

R. S. Black

Che Class at Strathclyde Mc Sustinability and Environmental Studies (42) (*) Mc Sustinability and Environmental Engineering (12) Mc Sustinability (1300) (1300) Mc Sustinability (1300) Mc Sustatinability (1300) Mc Sustatinability (1300)</li

Week 1 –	Key principles of Circular Economy and bioeconomy. Case study presentation: Closing The Loop on Coffee Shop Waste Review-Eco. Classow https://www.eco.com
Week 2 – Week 3 –	Key principles of sustainability and the Sustainable Development Goals (SDGs). Key Principles of Life Cycle Assessment (LCA) (Zero Waste Scotland).
Week 4 –	Two talks: a) Risks and opportunities of circular projects (Mabbett & Associates Ltd). b) How best to support the Scottish construction and built environment sector to be more circular? (Zero Waste Scotland)
Week 5 – Week 6 –	Transitioning to a circular economy: the Macro, Meso and Micro level (Circular Economy Policy Analyst), Bioeconomy principles, the BE-Rural and POWER4BIO European projects. Case study presentation: applications of biogrouting in civil and geotechnical engineering.
Week 7 –	Two talks: a) Beneficial reuse of dredged canal and harbour sediment and its contribution to CE. b) The circular economy of plastic and its sustainability and the issue of microplastics.
Week 8 –	Circular Glasgow and Circle Assessment tool for Businesses (Circular Glasgow, Glasgow Chamber of Commerce, www.circularglasgow.com)
Week 9 –	Two talks: a) Extending product life through repair, refurbishment and remanufacture (Department of Design, Manufacture and Engineering Management, University of Stathclyde). b) The role of geoengineering, carbon capture and Storge, and mine water heating in the circular economy.
Week 10	- Design for Value Workshop: Construct for Deconstruction with Conscious Sequestration.



- ALLA	Assignments CE Class
More	fundamentally, I wanted students to contribute to CE and sustainability via the assignments!
Assignment 1	Database of most interesting papers linked to Circular Economy, Bioeconomy or Sustainability. Each student writes one entry in a database on a unique paper, including a 300 word s review of the paper – "would you recommend others to read it and why?". This is a resource for all students to use (3% final mark). <u>https://docs.moodle.org/311/en/Database_activity</u>
Assignment 2	Group coursework – create a new circular business model or a new bioproduct (group report worth 47% of the final mark).
Assignment 3	Individual report evaluating self-transformation to wards su stainability and circularity (worth 50% of the final mark).

Assignments CE Class P- Mart

Group work - create a new circular business or new bioproduct This can be done with students of any age. The added complexity for older students, comes from the evaluation of the proposed new business of bioproduct.

- cornestrom the evaluation of the proposed new business of bioproduct. Create a new business that a dopts E principles to disrupt the sec for. As an exa mple, one student lastye or though to f a new company that she colled "Circular Pizzo" where a pizzo delivery service would use evusable baxes (and would keep pizzos warm), instead of the usual condoard baxes that you thow away as soon as the pizzo a mices. The idea was that the pizzo a mices, the pizzo the decourse business the enusable baxes away. Give relevant 18 te for company/business and explain clearly what this company host and in what context would this company/business openet led, county, region. For new bioproduct, also evaluate potential performance. Undertake aSWOT analysis of the business with regards to its potential for disruption. Evaluate how the new business relates to at least two Sustainable Development Cools (SDG-1) and their targets. Citical analysis looking at the new company in a systemic way e.g. how creating this company may affect to the r commande. (In a pricing or prediction would be pictor the cools is contained baxes) will non-
- 2
- companies (in a positive or negative way) and how new company may be affected by the context where it will run. Evaluate how new biop rod uct or new circ ular busi ness will contribute to **env iron mental improvement** (e.g. red uction
- of GRG Emissions, water consumption, waste, pollution, orvalorisation product currently going to water by Optionally, a) com pare the new company/business with an other traditional "line ar' company that the CE company you created might be is competing with b) evalue to social and/or economic effects (e.g. could the new product/sompany create more local jobs or improve the local economy? Would the new product/company require a skilled workforce?)





Individual report evaluating self-transformation towards sustainability and circularity

Students write report evaluating own transformation with regards to increasing circularity & sustainability in their own activities (up to students to decide what to do, e.g. plastics, textiles, food waste, water).

This is an assignment not just on change but, very importantly, on trying to measure that change.

This can be done with students of any age. The added complexity for older students. comes from the evaluation of the self-transformation.







- to collect the data and measure change. 10. Appendices may be needed to support the calculations doneand data collected.















	Award winning schools					
Green Gown	Awarding Sustainability Excellence since 2004					
Established in 2004, the Green Gown Aw inititatives being undertaken by universitie agenda, the Awards have become establi practice within the further and higher edu	Established in 2004, the Green Gown Awards recognise the exceptional sustainability initiatives being undertaken by universities and colleges. With sustainability moving up the agerda, the Awards have become established as the most prestigious recognition of best practice within the further and higher education sector.					
International Green G Finalists	own Awards – 2021					
Announcing the 2021 International Gown Award Finalists	Green Same Cos					
We are delighted to reveal the finalists of t International Green Gown Awards, We has Finalistic from 25 occurring from 20 occurring from around the	the 2021 Construct Autors Autors Construction 2021					
The winners will be announced on on 7th. part of the United Nations High-Lever Polit Forum. Find our may about the <u>Annial Co</u>						
The International Orient Own Amountain the by Limited Manace and Amountain the by The Advancement of Commonwealth Link (ACUL), Longers and International Association of Link (ACUL) and International Association of Link (ACU).						















- ALLE		Examples of bioeconom feedstocks (or raw material
Agri-food sector Advinal - Flax Arimal - Grass manure - Nuts Apples - Miscan - Apples - Miscan - Apples - Miscan - Apples - Miscan - Barley - Potatose - Beret - Rice - Catton - Suriflow	US Samboo - Post - Banches wood - Banches wood - Banches wood - Banches wood - Banches - Softwood - Banches - Softwood - Geliulose - Shumps - Hardwood - Wood - Leaves - Leaves	Fisheries & aquaculture sector • micro and macro alge (also potentially beach cast alges (also moducts: shiring to water plants (also moducts: allogs shells), water plants (also from aquagonics) • crustaceans (including poducts: shiring scale fish including by-poducts: bones, skin, oils, heads, viscen, bills, fins, cateler, water plants (also provided they are bills, fins, cateler, substantial provided they
Com/maize Tobacco Citrus fruits Wheat Dairy produce		mince, blood, fish produced. excrements)





















Projects need to think about net positive outcomes









- 15:45 17:15 CET (2:45-415 pm UK time)

 Connecting student learning with industry projects, lessons from Strathclyde

 Novel ways to maximise potential of bioeconomy of different sectors

 Workshop on teaching bioeconomy in each of the five innovation regions, grouped by country and language
- 17:15 17:30 CET (4.15-430 pm UK time) • Short poll about Day 2 of the summer school • Q&A, summary day 2, and link to day 3

Day 1 Mini-Snowball discussion

In Day 1 of the Summer School, we discussed the following in small groups:

If you had all the money, time and resources you needed (e.g. 1 million EUR, 2 full days each week, and you were the education minister of the country), what would be the best ways for bioeconomy learning to be integrated in school teaching?"

Day 2 follow-up discussion

Today, Day 2 of the Summer School, we want you to discuss:

R-Wat

How will you implement the teaching of bioeconomy in your school and country?

We are going to group you by country and language, and we are happy for you to discuss in your own language.

You can write your thoughts either in English or in your own language (as we will then translate to English).

			Day 2 fol	low-up discus	sior	
How will y	How will you implement the teaching of bioeconomy in your school and country?					
A: How to incorpo of bioeconom	A: How to incorporate the teaching of bioeconomy in schools? B: Where best to incorporate the teaching of bioeconomy in different					
Subject teaching. Workshops creating or using new	Extra curricular activities, like school clubs.		Art Craft Design	Business Economics Entrepreneurs hip		
Laboratory access. School trips.	Events, grants & Competitions Industry talks.		Biology Computing STEM	G eography Psychology Sociology		
Site visits.	Industry projects.	STEN	1 = Science, Technolo	ogy, Engineering, Mathematics		

and the second s	Contraction of the second seco			Day 2 foll	ow-up di	scussior	
	Reporting from the groups						
A	How will you implement the teaching of bioeconomy in your school and country? A: Howto incorporate the teaching of bioeconomy in schools?					my the erent	
	Subject teaching. Workshops creating or using new materials. Laboratory access.	Extra curricular activities, like school clubs. Events, grants & Competitions Industry talks		Art Craft Design Biology Computing	Business Economics Entrepreneurs hip Geography Psychology		
	School trips. Site visits.	Industry projects.		STEM	Sociology		









	Day 3 outline programme
BE-Rural	14:00 – 15:30 CET (1-2.30pm UK time)
	 Introduction to Day 3 of the Summer School. Introduction to IBioIC – who we are, what we do (Rachel Moir, Skills Programme Manager, IBioIC) – plus Q&A with speaker
https://be-rural.eu	 Scottish Bioeconomy Strategy & its context in a school setting (Debbie McCreath, IBioIC) – plus Q&A with speaker
	Engagement strategies with STEM (Graeme Rough, Head of STEM programmes, Scottish
	Schools Education Research Centre) – plus Q&A with speaker
	Break (15:30 – 15:45 CET) (2.30-2.45 pm UK time)
	15:45 – 16:55 CET (2:45-355pm UK time) • Leaden in Science Pogramme (Dr JoSadler, Leaden in Science Founder & Chancellor's Fellow, Univenity of Edithubility – Jour GAAwith ; peaker • Social Mobility Foundation and STEM (Speaker TBC) – plus QBA with speaker
	16:55 – 17:30 CET (3:55-4:30 pm UK time) Fill feedback survey about Day 3 and summer school overall
	 Final Q&A considering content of three days of the summer school Close (Rachel Moir, IBiolC and Dr Elsa João, University of Strathclyde)

