



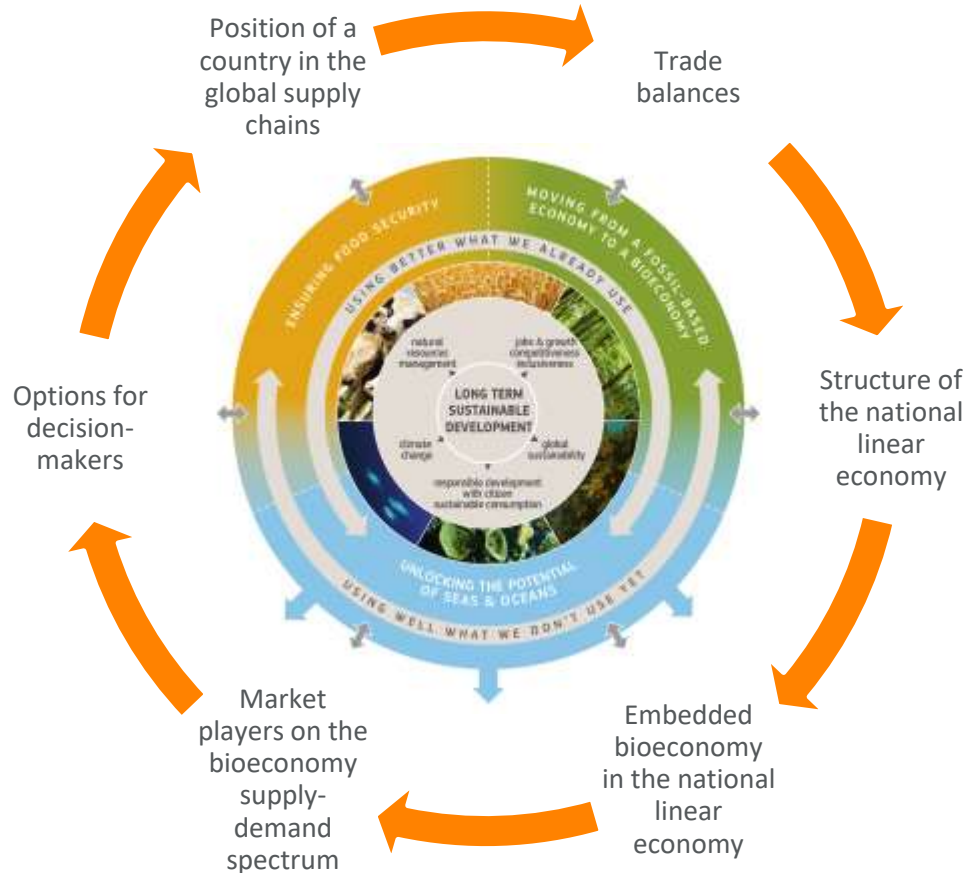
# Evidence-based bioeconomy policy – case Croatia

[Biljana Kulišić](#)  
Energy Institute Hrvoje Pozar (EIHP)  
Dept. RES, EE and Environmental Protection, Croatia, [bkulic@eihp.hr](mailto:bkulic@eihp.hr)

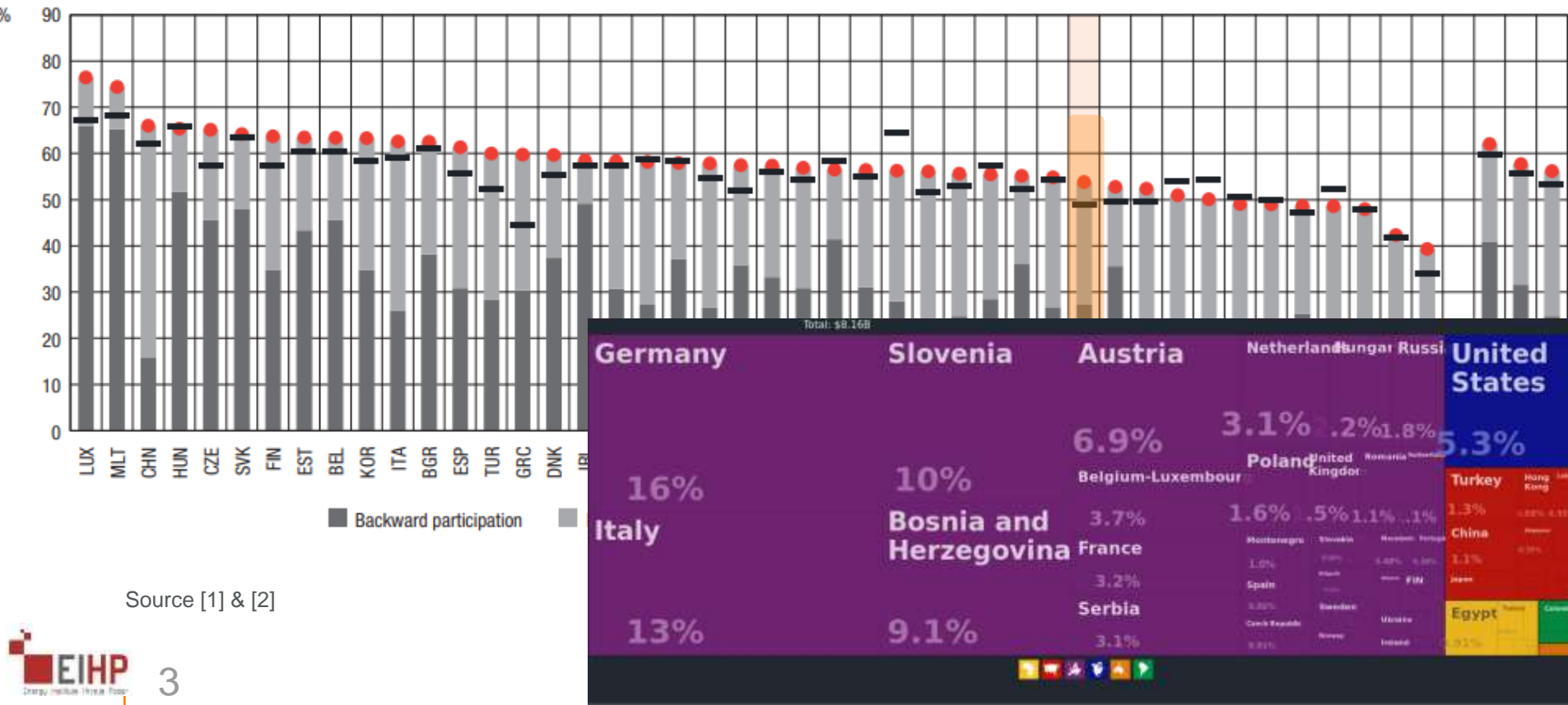
[Markus Lier](#)  
Natural Resources Institute Finland (Luke)  
Unit Bioeconomy and Environment, [markus.lier@luke.fi](mailto:markus.lier@luke.fi)



# Statistical evidence based bioeconomy policy

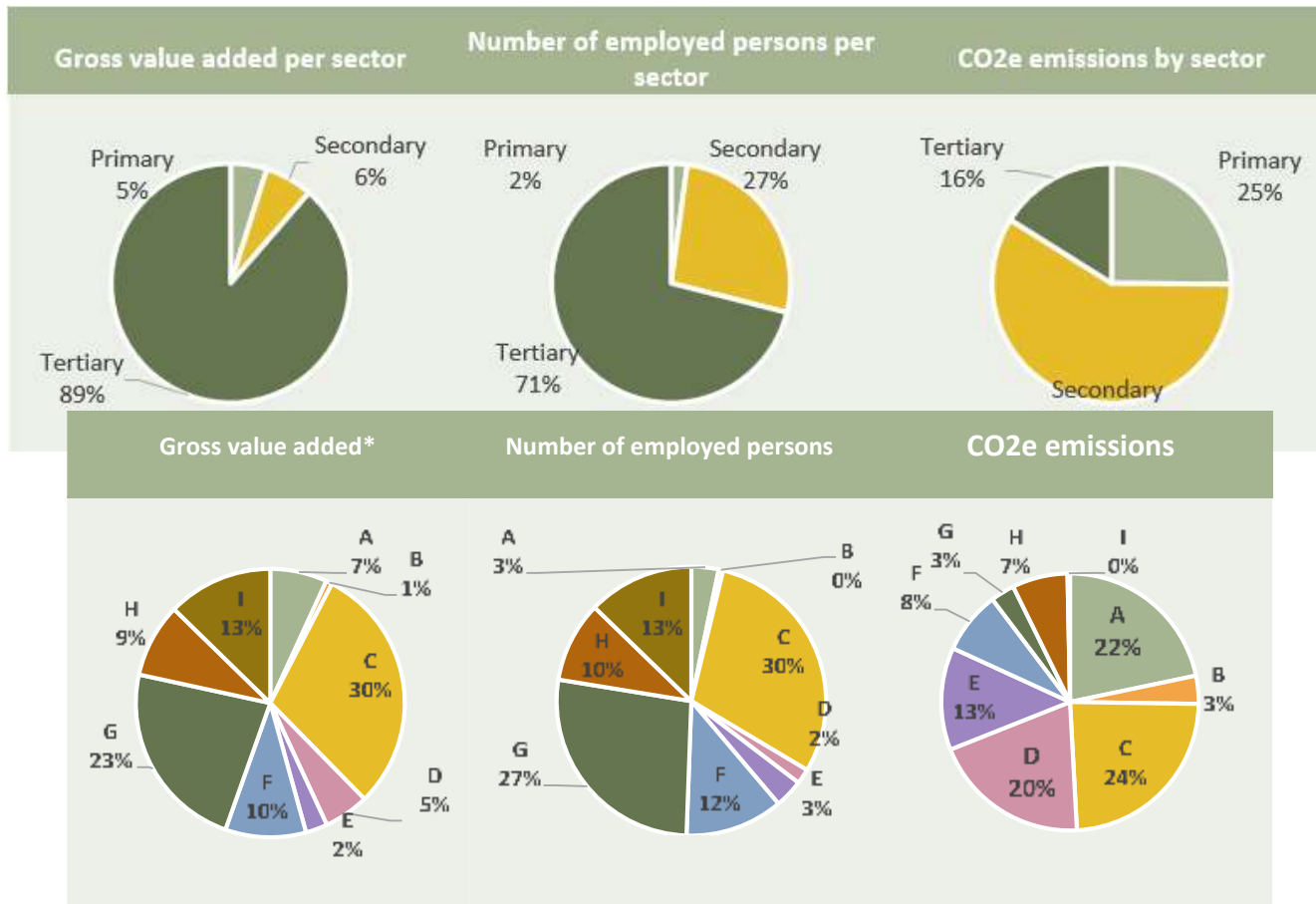


# Example: Croatia – position in the global value chains & trade balances



Source [1] & [2]

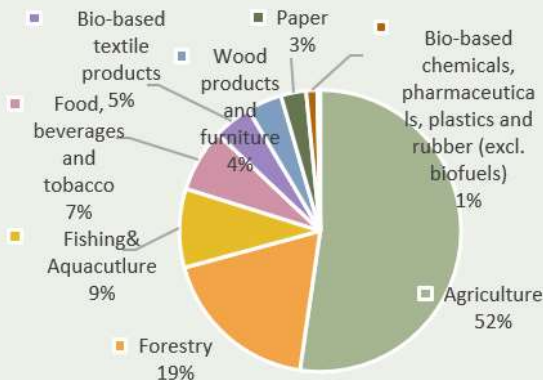
# Structure of the Croatian linear economy



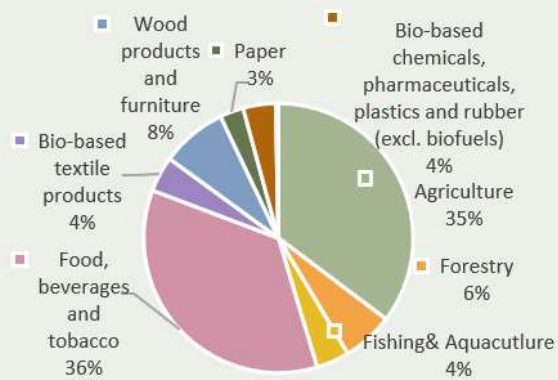
Source [3 & 4]

# Structure of the embedded Croatian bioeconomy

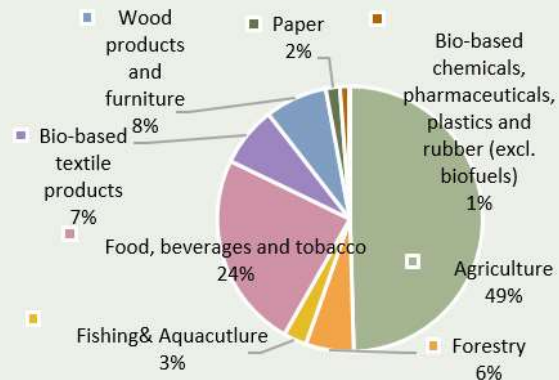
Turnover



Value added



Employment

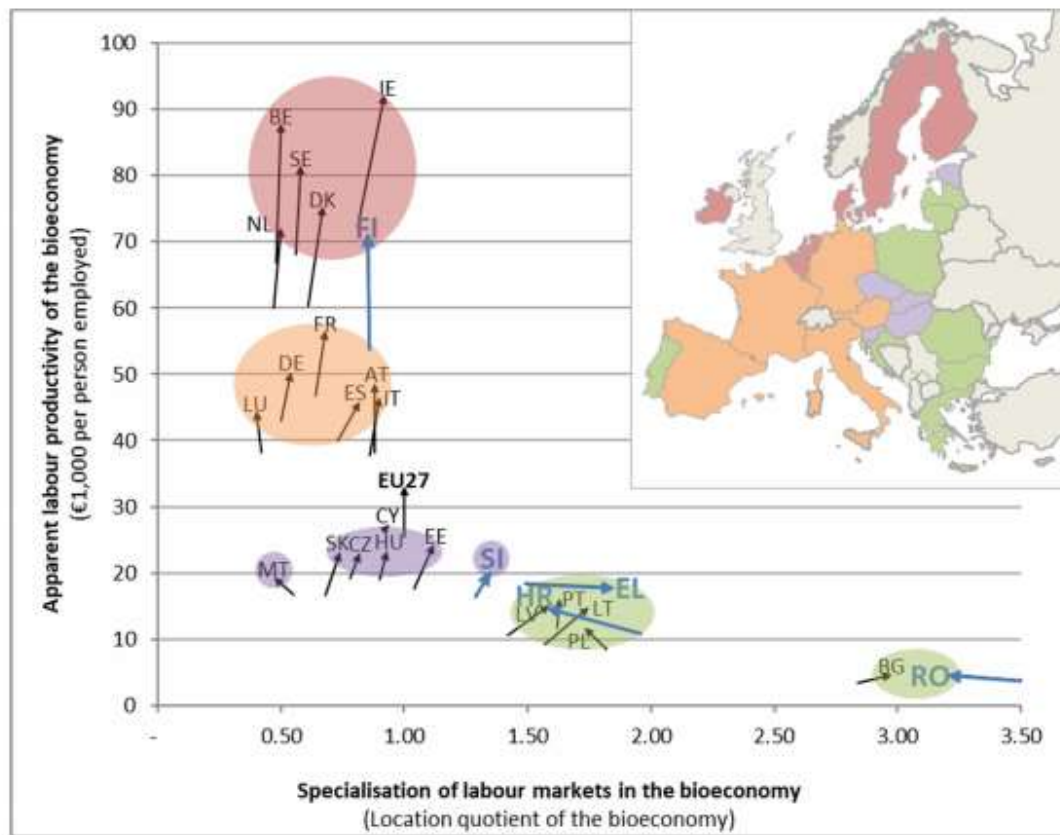


**estimated to 217,000 employees that generate 11.33 M€ turnover and 3.47 M€ of Value added (2017)**

- turnover per person employed: ~ 52.2 k€ (EU average: 125 k€)
- value added per person employed: ~ 15.9 k€ (EU average: 34 k€)

## Position of the Croatian bioeconomy in the EU

Source [5]



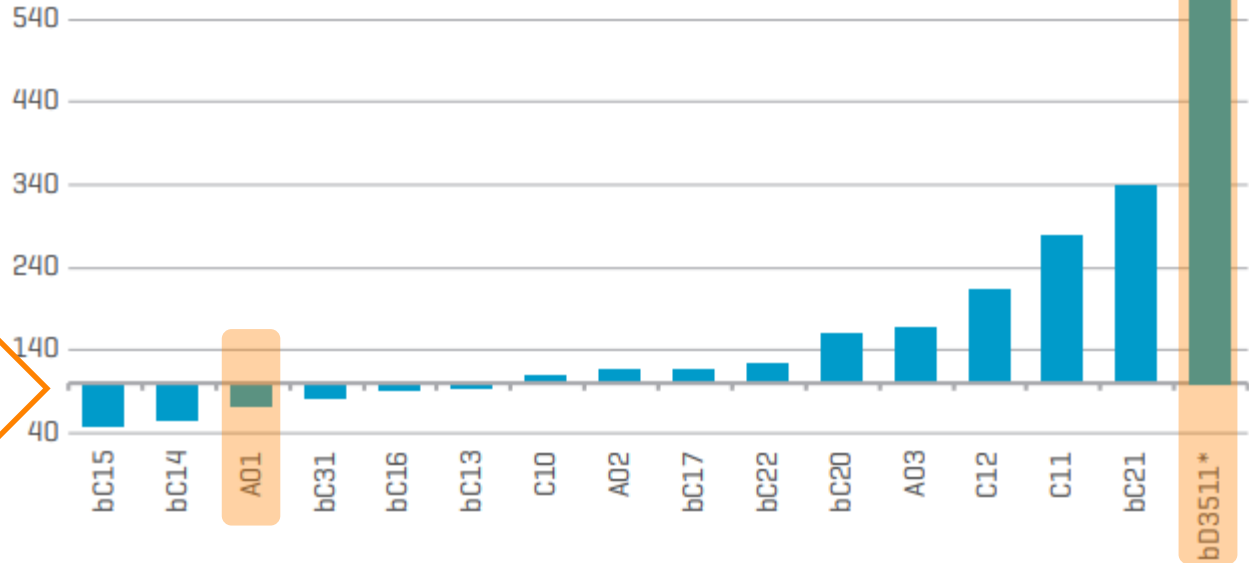
**Figure 3.** Evolution of the location quotient and apparent labour productivity in the bioeconomy of the 27 EU Member States, 2008–2010 to 2015–2017 (cases shown in blue are those discussed in Section 0 below).

Source [6]

# VA per employed person in the Croatian bioeconomy, by sector

NACE Code	Bioeconomy Sector (Parent Categories in Bold)
A01	<b>Agriculture</b>
A02	<b>Forestry</b>
A03	<b>Fishing and aquaculture</b>
A032	Aquaculture
A031	Fishing
-	<b>Manufacture of food, beverages and tobacco</b>
C10	Manufacture of food
C11	Manufacture of beverages
C12	Manufacture of tobacco
-	<b>Manufacture of bio-based textiles</b>
C13 *	Manufacture of <u>bio-based</u> textiles
C14 *	Manufacture of <u>bio-based</u> wearing apparel
C15	Manufacture of leather
-	<b>Manufacture of wood products and furniture</b>
C16	Manufacture of wood products
C31 *	Manufacture of <u>wooden</u> furniture
C17	<b>Manufacture of paper</b>
-	<b>Manufacture of <u>bio-based</u> chemicals, pharmaceuticals, plastic</b>
C20 *	Manufacture of <u>bio-based</u> chemicals (excl
C21 *	Manufacture of <u>bio-based</u> pharmaco
C22 *	Manufacture of bio-based plastics an
-	<b>Manufacture of liquid biofuel</b>
C2014 *	Manufacture of <u>bioethanol</u>
C2059 *	Manufacture of <u>biodiesel</u>
D3511 *	<b>Production of bioelectricity</b>

\* hybrid sector.



100 = Average VA per employee for HR bioeconomy

Source [5,7,8]

# Market players on the bioeconomy supply-demand spectrum



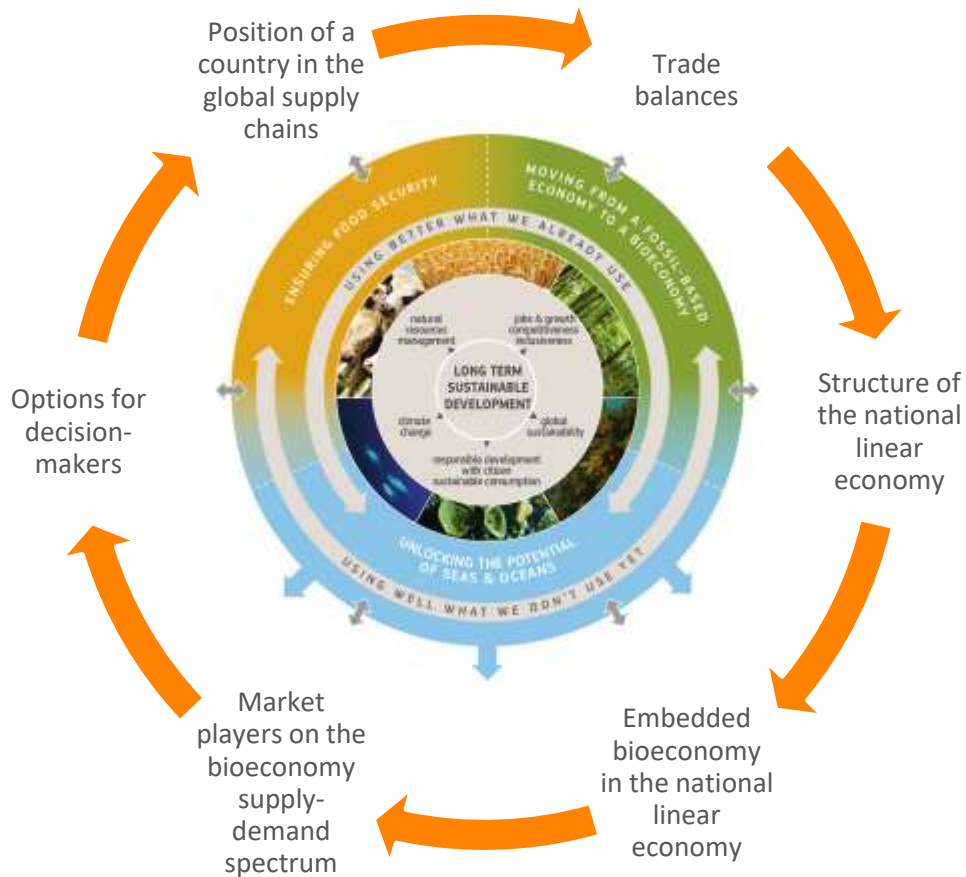
Source [9]



# Example of options for the decision makers in Croatia (draft)

1. Generating spin offs of new value-added chains from **waste and by-product streams from field to fork production** (72% of the current bioeconomy), aiming at:
  - reducing fossil carbon in their production chain
  - R&D for bio-based packaging for tourism, accommodation and food industry
  - Supporting transition of the national VA champions: bC21 to increase the share of the bio-based cosmetics and pharmaceuticals
2. Increasing the share of A03 **fishing and aquaculture for bioeconomy**
  - A03 sector has higher VA/employee than the national average
  - Possible synergies with biogas production with digestate
3. **New business models for C11 beverage industry** to transition to bioeconomy (renewable energy, circular economy, new VA chains from by-products and waste streams).
4. Horizontal action: **Improving energy efficiency and expanding the use of RES**

# Statistical evidence based bioeconomy policy: verifying the outcomes of the selected options



## Sources

- [1] Vidaković Peruško, I.; Kovač, K.; Jošić M. Croatia in Global Value Chains. Surveys S-32; Croatian National Bank, Zagreb, February 2018
- [2] OECD Country profile: Croatia, available at: <https://oec.world/en/profile/country/hrv/>, accessed at 23 February 2020.
- [3] Eurostat, 2019
- [4] Croatian Bureau of Statistics, 2020
- [5] JRC, Socioeconomic Indicators to Monitor the EU's Bioeconomy in Transition;  
<https://datam.jrc.ec.europa.eu/datam/mashup/BIOECONOMICS/index.html?rdr=1591178537080>
- [6] Ronzon, T.; Piotrowski, S.; Tamosiunas, S.; Dammer, L.; Carus, M.; M'Barek, R. Developments of Economic Growth and Employment in Bioeconomy Sectors across the EU. *Sustainability* 2020, 12, 4507.
- [7] Kulišić, B. Bioeconomy Sector Analysis, Sektorske analize, 74:9 (32 p), Economic Institute of Zagreb, February 2020, in Croatian
- [8] Ronzon, T.; M'Barek, R. Socioeconomic Indicators to Monitor the EU's Bioeconomy in Transition. *Sustainability* 2018, 10, 1745.
- [9] EIHP & LUKE, 2020



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