How to design business models for a circular economy?

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Context and problem statement

L’économie malade de ses modèles
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Par Antoine Reverchon (/journaliste/antoine-reverchon/)

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What is Circular Economy?

• Circular economy = a new, alternative, more sustainable economic model
  <-> Linear economy = ‘take-make-dispose’

• Closed loop idea: reduce waste to a minimum, keep products, components and materials at their highest utility and value at all times by sharing, leasing, reusing, repairing and recycling → waste becomes a new resource

• CE < different schools of thought such as industrial ecology, cradle to cradle, performance economy, regenerative design...

• The term CE < D.W. Pearce and R.K. Turner (Economics of Natural Resources and the Environment, 1989)

• CE has largely emerged from legislation rather than from academics (Murray et al. 2015)

“A circular economy is an industrial system that is restorative or regenerative by intention and design”

(Ellen MacArthur Foundation)
Circular Economy... and the agrifood sector

- Food: the largest fast-moving consumer goods category (EMF 2013)
- The current food production and consumption habits are unsustainable (Jurgilevich et al. 2016)
- Food: a major contributor to current waste streams, but with significant economic potential in being safely reintroduced into the biosphere (EMF 2013)
- Implications: reducing the amount of waste generated in the food system, valorisation of agricultural by-products and food waste, nutrient recycling, and changes in diets toward more diverse and sustainable food patterns (Jurgilevich et al. 2016)
Circular Economy... and new business models

**Business Model:** “the rationale of how an organization creates, delivers and captures value” (Osterwalder & Pigneur; 2011)

**BM canvas:** used to analyse the activities, objectives, methods and resources of a firm that ensure its viability

**Circular Business Model:**

Lewandowski (2016):
- *Take-back system:* including the idea of material loops where products, components or materials can be reused if collected back from the consumer
- *Adoption factors:* a transition towards circular business models must be supported by various internal organisational capabilities and external (technological, political, sociocultural, economic) factors

Antikainen & Valkokari (2016):
- *Business ecosystem level:* current trends & drivers + stakeholder involvement
- *Sustainability impact:* environmental, social and business
Research objective and methodology

• Here, we present the structure of such a novel circular business model from the agri-food sector, the kind of value proposed and the critical success factors

< analytical framework developed in WP5 of the H2020 NoAW project

• Case study of the union of cooperatives Grap’Sud in the South of France, which valorises waste and by-products from the wine industry
Results: the union of cooperatives Grap’Sud

→ A union of 7 wine cooperatives located in the South of France, with 210 employees on 6 production sites

**Waste valorised / year:**
- 125 000 tonnes of grape marc
- 270 000 hl of wine lees
- 600 000 hl of wine most

→ A diversity of new value-added products issued from by-products (B2B and B2C):
Results: The union of cooperatives Grap’Sud

Key triggers of the initiative at the origin:
- 1969: ensure the existence of the wine cooperative in Cruviers-Lascours
- 1970: law that obliges winemakers to deliver their waste for distillation

Key objectives of the initiative at the origin:
- Valorization of grape marc for distillation as response to legal obligation

Key historical milestones between origin and today:
- 1994: diversification towards food industry and nutraceuticals
- 2007: geographical expansion (Alsace)
- 2014: new law that cancels the obligation of waste delivery

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**ORIGINATION**

**KEY IMPACTS (current)**

- Agro Waste valorized
  - Grape marc, wine lees, wine must, waste from olives and apples, and from dates from Tunisia
- Job created / typology
  - 210 jobs
- Other impacts
  - Contribution to local economic development, reduction of environmental impact by waste-valorization

**KEY ACTORS & PARTNERS**

<table>
<thead>
<tr>
<th>Category/Expertise</th>
<th>Responsibility in initiative</th>
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<tbody>
<tr>
<td>Grap’Sud in Cruviers-Lascours (Gard) as founder and main site</td>
<td>Initiator and leader with direction, administration, production and R&amp;D, ~100 employees</td>
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<tr>
<td>6 other production sites, several waste collection centers</td>
<td>Production &amp; collection</td>
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<tr>
<td>The cooperatives</td>
<td>Waste delivery</td>
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<tr>
<td>Partnerships with several enterprises and research organizations</td>
<td>Stimulate and contribute to product innovations</td>
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</table>
Results: The union of cooperatives Grap’Sud

**ORGANIZATIONAL MODEL**
- Governance / coordination: Direction at Cruviers-Lascours defines the strategic axes of the group
- Shared infrastructure / financing: 1 financial holding and 4 subsidiaries
- Cooperation with Science & technology: Cooperation with research institutes (INRA, Montpellier SupAgro...)
- Support mechanisms: Public financial support

**KEY SIDE-STREAM VALORIZATION (Agro waste)**
- Waste typology / Yearly volume / Seasonality: 125,000 tons of grape marc, 270,000 hl wine lees, 600,000 hl wine must
- Valorization processes / key technologies: Extraction / concentration, Advanced / innovative technologies
- Maturity of technologies used / critical size for feasibility: Natural ingredients for Nutraceuticals, Food industry, Animal, Nutrition, Oenology, Agro-Industries, Alcohol & Spirits
- Key outputs and markets

**Example of cascade of valorization:**
- Winemakers → Cooperatives → Grap’Sud: core business = transforming raw into value-added products & applications → Diverse products & applications: fruit sugars, alcool & spirits, grape seed extracts, natural grape colourings...

**SUCCESS & FAILURE FACTORS**
- Organizational / Spatial: Geographical expansion
- Technical / Logistic: Optimization of logistics costs
- Economic / Financial / market: Public financial support is critical
- Social / skills: Innovation capacities & product portfolio extension
- Others: ...
Conclusions

The structure and persistence of a circular business model depend on internal + external factors:

• adopting innovative technologies for highly value-added products
• sufficient quantity and quality of agro-waste and by-products
• strong cooperation with research partners and suppliers
• flexibility in the production capacity (seasonality and climate conditions)
• continuous product innovation
• targeted marketing needed in order to be profitable and competitive on the markets
• public financial support + legal framework as important external determinants

→ circular business models within the agrifood sector should be designed according to territorial conditions; more European or Mediterranean projects focusing on cases dealing with territorialized circular economy models would be highly interesting
→ translating technology into business while fulfilling environmental and economic goals remains a real challenge for achieving a transition to a circular economy in the agri-food sector
Thank you very much for your attention!

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