

## AlpBioEco

# Regional Implementation Guidelines

Region: Upper Austria

Business Model: **Disposable Tableware and  
Biodegradable Packaging**



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## 1. INTRODUCTION

The ecosystems of the Alps are exposed to environmental problems caused by economic activities and climate change. Moreover, agricultural business, producers and manufacturers in the European Alps face fierce competition on the global marketplace. There is an enormous potential for green ecological growth and workplace creation due to the development of a sustainable bio-economy. Innovative use and value of regional resources strengthens regional business. Currently not all bio-economic potential is used. One problem is that many supply chains in the European Alps are not sufficiently connected. Many waste and by-products are not used, they are just dumped or composted instead of reusing them to develop new products in accordance with a good ecological Recycling Management.

In addition, there is a lack of coherent policies and strategies to support bio-based supply chains. This is exactly where the project AlpBioEco comes into play: It fosters a territorial development of the agricultural sector using innovative methods, above all innovation for small and medium-sized businesses and strengthens economy and cooperation in the European Alps.

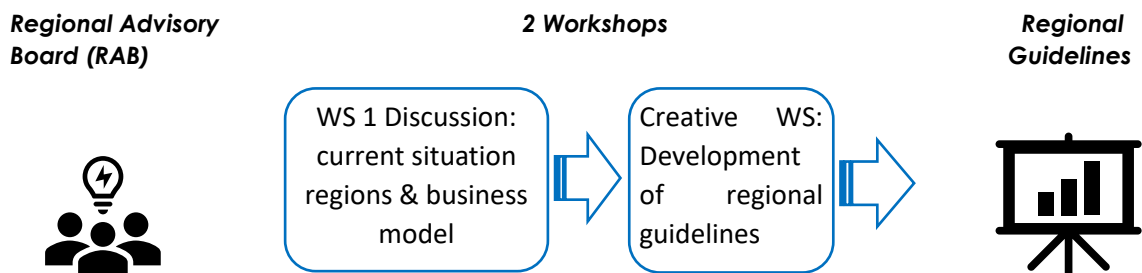
The overall goal of AlpBioEco is to foster a sustainable economy and support the markets and competitiveness of a bio-based economy in the European Alps. It focuses on supply chains of bio-based food and plant extracts. The project works especially on walnuts, apples and herbs which were analysed to identify their potentials. AlpBioEco uses „open innovation concepts“ to develop proper business concepts for different regions.

The following guide should speed up the implementation of these business models and the development of bio-economy in Upper Austria. The guide provides clear recommendations for involved decision makers in politics and economy like different Chambers, Clusters and Research Institutions. On the other hand, the guide is also directed to all those producers and businesses that are searching for market niches and further development. A detailed guideline shows all steps for implementing new business models – from market research to product development. It includes important facts about raw material and financial funding to facilitate the implementation of the new business model.

## 2. METHODS

In order to develop a guide for all project regions, which specifically focuses on this business models, Regional Advisory Boards (RAB) for each of the 10 regions were created. The RAB consists of experts from different fields (politics, economy, regional development, agriculture, food production, food supply, legal representatives of interests). All those experts provide their expertise and together they work on a successful implementation of the business model. The RAB dynamically connects all relevant stakeholders of a region in order to create and foster new supply chains and new opportunities that have not been taken into account previously. The RAB consists of the most important stakeholders of the bio-economy sector within a region and so it also provides a network which is of importance for future platforms / projects / recommendations.

First step was to collect information from a region and show the current situation. This was made by the RAB in different workshops under the supervision of an AlpBioEco project partner. Second step was to develop a common vision of how to elaborate recommendations for politics based on the project. This was made in a second workshop with creative workshop methods like for example: Lego Serious Play®, Mural Tool or PESTEL. Due to the current health situation (Covid 19) all meetings were held online, offline, or hybrid versions.



*Work steps performed when developing regional guides*

A chairman/chairwoman was nominated for each RAB. This chairman/chairwoman is responsible for presenting and discussing the elaborated recommendations at an international meeting, the so called „Transnational Transfer Meeting“. In this meeting not only the regional guides are presented, but also a transnational and transregional guide is developed. In this guide's transnational and transregional guidelines the project regions are presented as role models and pioneer regions and serve as model regions for others .



*Work steps performed when developing transnational guides*

### Overview Members RAB Region Upper Austria

Role	Name	Business/ Organisation	Sector	Network
Chairwoman	DI Heidrun Hochreiter	Cluster Manager– Food Cluster	Cluster	international
Member RAB	Dr. Hubert Fachberger	Secondary School for Agriculture - St. Florian	Apprenticeship	regional
Member RAB	Mag. Heinrich Mayr, MBA	Chamber of Commerce Upper Austria	Legal Representatives of Interests	international
Member RAB	Mag. Karl Dietachmair	Chamber of Agriculture Upper Austria	Legal Representatives of Interests	national
Member RAB	1 Representative	Office of the Government of Upper Austria,	Politics	regional

		Department of Regional Planning, Economic and Rural Development, Dept. Economy and Research		
Member RAB	DI Michaela Hartl	HBLA Elmerg - Secondary School for Agriculture and Food	Apprenticeship	regional

### 3. PRODUCT DESCRIPTION

Biobased and biodegradable packaging based on apple pomace is a highly promising alternative to existing conventional plastic products in order to reduce environmental pollution caused by plastic waste. Its relevance will become even greater when single-use plastic products will be forbidden due to EU legislation by 2021. Disposable tableware and bio-degradable packaging made from apple pomace is likely to be accepted by consumers due to their increased awareness of this topic and their increasing need for better alternatives to conventional plastic.



Biodegradable straws made of apple pomace

#### Pilot Activities

For the project, we collaborated with a research centre for scientific analysis of apple pomace. The aim was to gain deeper knowledge about the raw material, e.g. whether and how different varieties of apple pomace require different production parameters, and which raw material is more or less promising for further research in this field of application. Four different samples were analysed. To compare the different samples, they were all subjected to the same procedure. The same solvents, temperature and duration were used for the extractions. The results of the analysis show that the drying process of the apple pomace has an influence on the composition of the ingredients and nutrients. This is an important aspect, because apple pomace containing a high amount of important nutrients should not be used for packaging. Instead, it could preferably be used for further processing into products for human consumption or as animal feed, since the high content of e.g. sugar and protein is also beneficial to animals.



Apple pomace for analyses (M. Feichtinger, Master Theses, FH Wels)

#### 3.1 BUSINESS AND MARKETING OPPORTUNITIES

A large amount of apple pomace is currently used for animal feed. For apple juice producers, selling apple pomace to packaging companies (which produce and/or sell the disposable tableware and biodegradable packaging) would be an attractive opportunity to increase the valorisation of their by-product. The first choice for the marketing of disposable tableware and packaging products would be business to business - "B2B". For example, standardised products and single-use dishes can

be sold and distributed via gastronomy suppliers and via wholesalers. A second promising opportunity would be B2B marketing through cooperation with food producing companies, which are in need of more sustainable, alternative packaging materials. For example, a great opportunity lies in the replacement of conventional plastic yoghurt cups. In general, biodegradable packaging is perceived as a possibility to stand out from the competition, as it offers a unique selling proposition USP on the market, which can in turn have a positive effect on the companies.

### 3.2 ADDITIONAL INFORMATION AND CONTACTS

You can find additional information about the Disposable Tableware and Biodegradable Packaging business model [here](#).

If you want to get more information about this business model or on our related research activities, you can contact the following AlpBioEco project partner:

*Austria/Business Upper Austria/Heidrun Hochreiter/email: [heidrun.hochreiter@biz-up.at](mailto:heidrun.hochreiter@biz-up.at) | [www.biz-up.at](http://www.biz-up.at) | [www.lebensmittel-cluster.at](http://www.lebensmittel-cluster.at)*

For the development of this business model, we have worked with the following organisation:

*Austria/University of Applied Sciences Upper Austria / FH OÖ Forschungs- und Entwicklungs GmbH / DI<sup>in</sup>Dr.<sup>in</sup> Bettina Schwarzinger/email: [research@fh-ooe.at](mailto:research@fh-ooe.at) / <https://forschung.fh-ooe.at/en/>*

## 4. CURRENT SITUATION

### 4.1 BIO-ECONOMY

#### Comparing European bio-economy strategies

For their Master Studies "Bio-Economy" four students of the University of Hohenheim analysed and compared special national bio-economy strategies (France, Austria, Germany, Slovenia, and Italy) to develop a sustainable bio-economy. A comparing overview of strategies represents an important basis for recommendations for strategy improvement and for developing easier innovation processes of sustainable, ecologically innovative business models. It could also be of importance for supporting trans-regional and interdisciplinary cooperation in the European Alps.

The result was that different nations had different stages and different details of progress concerning bio-economy strategies. Only a few countries had no bio-economy strategy or no action plan following the strategy. Strategies also depend very much on the background: Germany, for instance, concentrates on the industrialising of eco-economies, France published the strategy via their Ministry of Agriculture, so they focussed accordingly.

#### Austrian Bio-economy Strategy

Since March 2013 Austria has a strategy for bio-economy. It is a guideline for all bio-economically relevant actions until the year 2030. This strategy shows actions and points out specific measures for implementing a bio-based economy in Austria. They currently work on an action plan for bio-economy based on the strategy in which they address all relevant players in this field. All relevant stakeholders are involved and all existing programmes are taken into account to implement bio-economic issues. The Austrian Bio-economy Strategy is intended to foster knowledge and knowhow about bio-economy and to support the decarbonisation of the economic system.

Austrian Bio-economic Strategy :  
<https://www.bmk.gv.at/themen/innovation/publikationen/energieumwelttechnologie/biooekonomiestrategie.html>

#### Upper Vision

In Upper Austria the strategic economy and research policies are bundled in #Upper Vision 2030. They focus on the most relevant fields, however, all those fields which are the most promising ones and are becoming increasingly important in the future. Four action fields were identified, one is concerned with bio-economy.

**Action field: Efficient and sustainable industry and production in Upper Austria:** One of its goals is to develop new processes using more raw material and side products to improve efficiency and sustainability of material and processes to extend the product lifecycle.

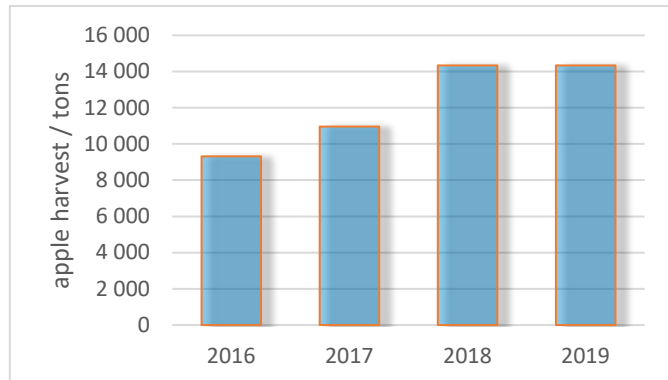
**Measure:** Development of new energy-optimized procedures and material:  
Bio-based and recycled raw material, cascading or combined use of raw material and continuous recycling economy.

Upper Vision: <https://www.uppervision.at/>

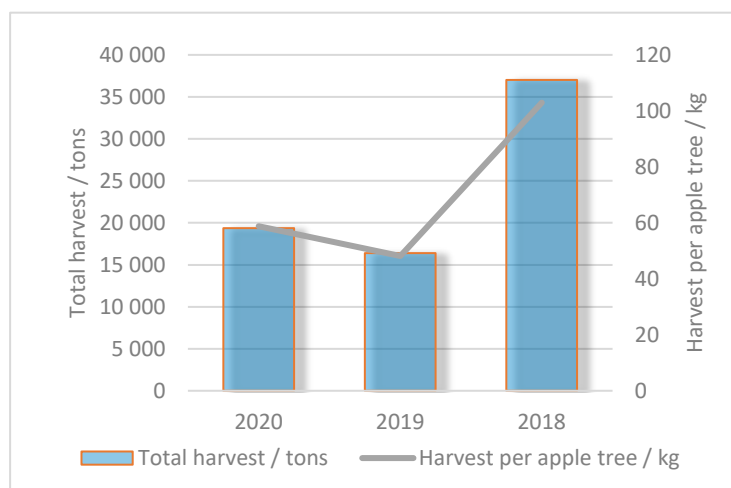


## 4.2 RAW MATERIAL

According to 'Statistik Austria', Austria had 6,590ha of apple plantations in the year 2019. In the harvest year 2018 about 234,000t of apples were harvested, so the harvest size doubled in the last two years. (Eva Schultz, 26.10.2020). This trend is likely to continue throughout the next years. In 2019 apple production (production quantity 184,300t) decreased significantly due to bad weather conditions, hopefully an exception year. In Upper Austria, however, production quantity remained steady compared to the previous year.



Apple harvest from apple plantations in Upper Austria since 2016 / tons (Source: Statistik Austria, Erhebung der Erwerbsobstanlagen)

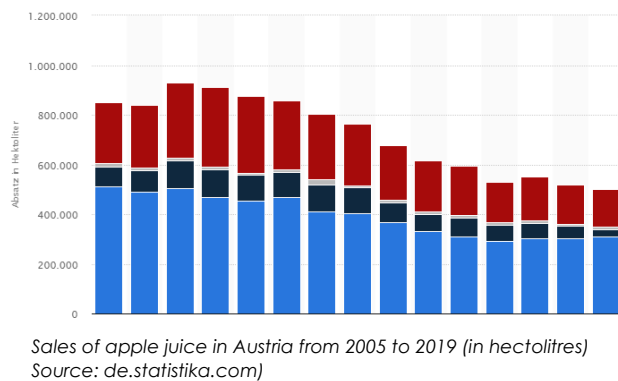


Apple harvest from orchards in Upper Austria / tons and harvest per apple tree / kg (Source: Statistik Austria, Obsternte 2018-2020 Extensivobst, Obsternte 2020: Extensive fruit preliminary results)

The next chart shows that the harvest quantity from plantations in Upper Austria fluctuates enormously due to quantity differences per apple tree. It was a big discussion of the RAB Regional Advisory Board how far orchards should be taken into account for disposable tableware and biodegradable packaging. The questions are if all manual work involved collecting apple pomace and delivering it to manufacturers will pay off for the farmers. But there is a trend reversal taking place: more and more orchards are re-farmed and the products are sold in small trade for the local market (apple gin, schnaps, cidre, etc.). However, it is doubtful whether apple pomace

from numerous single farmers meet the right quality standards for the production of disposable tableware and biodegradable packaging. We still need studies how far quality fluctuation and different ingredients and dryness influence the production process.





Depending on the press method the rate of juice yield is about 70 to 83 percentage by weight. [BIRUS, 2001]. Apple pomace remains as side product. 29,396 hectolitres of apple juice were sold in Austria in the year 2019. Nevertheless, apple juice consumption is declining slightly in Austria.

Self sufficiency is currently about 59 to 85 per cent for apples in Austria in the last two years. In autumn 2018 an additional 77,000t of cider apples had to be imported for

further production, for example, for apple juice. Domestic harvest quantities and qualities are not sufficient for constant and guaranteed domestic supply. Only 10 to 15 % of apples for pressing are from Austria (APA Press Release, Chamber of Commerce Mag. Katharina Koßdorff, Managing Director Food Industry's Association)

There are no detailed data available concerning press cake from apple juice production. We recommend to get in contact with the juice producers directly. In Upper Austria there are at least 3 businesses that produce big quantities of apple juice (Pfanner Hermann Getraenke GesmbH, Voglsam GMBH, S. Spitz GmbH).

So far, apple pomace is used as animal feed or composted or used in domestic biogas plants for energy production. For both, composting plants and biogas plants, the added value is extremely low. For biogas plants the apple pomace must be very dry for further processing. Since the content of protein is rather low and the content of sugar high further processing for animal feed is not favourable. In addition, the high chemical oxygen demand during composting causes contamination which is not desired (Shalini & Gupta, 2014). So further processing of apple pomace should be decided according to ingredients and dryness.

Links:

[https://www.statistik.at/web\\_de/statistiken/wirtschaft/land\\_und\\_forstwirtschaft/agrarstruktur\\_flaechen\\_ertraege/obst/index.html#index1](https://www.statistik.at/web_de/statistiken/wirtschaft/land_und_forstwirtschaft/agrarstruktur_flaechen_ertraege/obst/index.html#index1)

<https://de.statista.com/statistik/daten/studie/436723/umfrage/wichtigste-obstsorten-in-oesterreich-nach-anbauflaeche/#statisticContainer>

[https://www.statistik.at/web\\_de/statistiken/wirtschaft/land\\_und\\_forstwirtschaft/agrarstruktur\\_flaechen\\_ertraege/index.html](https://www.statistik.at/web_de/statistiken/wirtschaft/land_und_forstwirtschaft/agrarstruktur_flaechen_ertraege/index.html)

<https://de.statista.com/statistik/daten/studie/287166/umfrage/absatz-von-apfelsaft-in-oesterreich/>

### 4.3 ASSESSING MARKET AND CONSUMER BEHAVIOUR

The Upper Austrian RAB Regional Advisory Board supports almost unanimously the good and important idea of biodegradable packaging. In the context of the EU Packaging Directive (Directive (EU) 2018/852 of 30 March 2018) new biogenic alternatives and concepts are necessary to implement the EU guidelines. Resource efficiency should be improved and waste much more

appreciated as valuable resource for other products. According to the RAB deposit systems for packaging are a forecasted development in order to meet the goals of the EU Directive. Packaging industries and markets will be put under pressure. Additionally, increasing numbers of consumers become more critical and there is a growing demand for ecological solutions. Those producers of packaging solutions who are first to focus on disposable tableware will obtain an advantage over competitors.

There is a trend towards regionality, not only as a consequence of the Covid19 pandemic; local suppliers and small businesses with new ideas and unconventional methods are a step ahead of the rest. In Upper Austria four companies sell disposable tableware and biodegradable packaging:

Company	Address	Products
Daniela Piererfellner, Werbeartikel & kompostierbare Verpackungen	Am Steinhügel 13, 4271 St. Oswald-Freistadt, Mail: <a href="mailto:office@bioverpackungen.at">office@bioverpackungen.at</a> <a href="https://bioverpackungen.at/">https://bioverpackungen.at/</a>	Disposable biodegradable tableware made of cellulose, sugar cane, rPET, paper, etc
FELZMANN GmbH	Jaxstraße 7 4020 Linz Mail: <a href="mailto:office@felzmann.at">office@felzmann.at</a> <a href="http://www.felzmann.at">www.felzmann.at</a>	Cardboard and paper packaging, plastic packaging
Ing. Mag. Ewald Kapellner	Zeillergang 11 4030 Linz Mail: <a href="mailto:e.kapellner@aon.at">e.kapellner@aon.at</a> Web: <a href="http://www.bio-star.at">http://www.bio-star.at</a>	Homemade products from renewable resources - BioBag production/ bioplastics
MEDEWO GmbH	Gewerbepark Mauer 26, 4702 Wallern an der Trattnach Mail: <a href="mailto:office@medewo.at">office@medewo.at</a> <a href="https://www.medewo.com/">https://www.medewo.com/</a>	Sale and Development of products made of palm leaf, sugar cane, paper and cellulose

Retailers and producers of biodegradable packaging in Upper Austria

Many packaging producers develop biodegradable packaging solutions or disposable tableware in their research departments. Some very promising solutions have already been presented. Not only packaging producers are interested in the development of disposable tableware or biodegradable packaging, but also apple juice producers are in search of higher value added solutions for their apple pomace.

Name	Adresse	Info
Boldog Consulting e.U.	Tassilostraße 15/1 4642 Sattledt <a href="https://www.boldogconsulting.com">https://www.boldogconsulting.com</a>	Packaging industry, recycling industry, recycling economy, food industry for sustainable packaging solutions
DELSCI GmbH	Fabrikstraße 20 4050 Traun Web: <a href="https://www.delsci.com">https://www.delsci.com</a>	DELSCI GmbH is a private R&D business of delfortgroup AG which do research on the future of paper, especially of sustainable and intelligent solutions for packaging for food
Delfortgroup AG	Fabrikstraße 3, 4050 Traun Web: <a href="https://www.delfortgroup.com/de/">https://www.delfortgroup.com/de/</a>	Functional special paper for different use und different fields (cigarette paper, India paper, flexible packaging paper ,...)
Eurofoam GmbH	Greinerstraße 70 4550 Kremsmünster Web: <a href="http://www.eurofoam.at">http://www.eurofoam.at</a>	Production of polyurethane-flexible foam

Fischer Plastik GesmbH	Allhaming 101 4511 Allhaming Web: <a href="http://www.fischer-plastik.at">http://www.fischer-plastik.at</a>	Food wrapping foils, construction foils, textile packaging, bags
Greiner Packaging GmbH	Greinerstraße 70 4550 Kremsmünster Web: <a href="http://www.greiner-gpi.com">http://www.greiner-gpi.com</a>	Plastic packaging for different fields
Industrietechnik Filzwieser GmbH	Oberland 67 3334 Gafenz Web: <a href="http://www.filzwieser.eu">http://www.filzwieser.eu</a>	Foil extrusion, complex injection moulding, tool maker
Ing. Mag. Ewald Kapellner	Zeillergang 11 4030 Linz Web: <a href="http://www.bio-star.at">http://www.bio-star.at</a>	Homemade products from renewable resources - BioBag production/ bioplastics
JODL Verpackungen GmbH	Attersee Bundesstraße 7 4860 Lenzing Web: <a href="http://www.jodl.at">http://www.jodl.at</a>	Food wrapping foils and foil packaging
Jungwirth Industrievertretungen GmbH	Krakowitzerstraße 6 4400 Steyr Web: <a href="http://www.jungwirth.com">http://www.jungwirth.com</a>	Foil packaging, yoghurt cups, drinking cups
Kruschitz Gesellschaft m.b.H.	Werner-Heisenberg-Straße 5 9100 Völkermarkt Web: <a href="http://www.kruschitz-plastic.com">http://www.kruschitz-plastic.com</a>	Kruschitz GmbH recycles plastic waste, produces re-granulates with food approval and PET foils from 100% recycling material for food packaging
Mondi Paper Sales GmbH	Marxergasse 4A A-1030 Wien Web: <a href="https://www.mymondi.net/">https://www.mymondi.net/</a>	Paper and cellulose producer
packit! Verpackungen GmbH	Hermesstraße 7 A-4595 Waldneukirchen Web: <a href="https://www.packit.at/">https://www.packit.at/</a>	Cardboard, corrugated cardboard, insulated packaging
Smurfit Kappa Interwell GmbH & Co KG	Schellingstraße 40, 4053 Ansfelden Web: <a href="https://www.smurfitkappa.com/">https://www.smurfitkappa.com/</a>	Industrial packaging, E-Commerce packaging, retail packaging
Teamwork Holz- und Kunststoffverarbeitung GmbH	Jaxstraße 10-12 4020 Linz Web: <a href="https://www.team-work.at">https://www.team-work.at</a>	Prototypes-Parts, skin packaging, blister packaging, shrink bag packaging specially sealed wrapping
TECHNOFLEX Verpackungen GmbH	Gewerbepark Ader 6 4850 Timelkam Web: <a href="https://www.technoflex.biz">https://www.technoflex.biz</a>	Individual packaging and presentation solutions

Packaging producers in Upper Austria – Business Upper Austria, Wirtschaftsagentur Oberösterreich, database (incomplete data)

There is an enormous pressure on prices for food producers and sales are determined by price. Biodegradable packaging must therefore be produced in consistently high quality at low costs. 'The price of yoghurt cups made of apple pomace might be too high to be marketable', some critical voices of the RAB Regional Advisory Board remarked. Detailed cost calculation will be necessary for each product and market niche.

The economic framework and consumer trends seem to be ideal for new ecological packaging solutions. Consumers are forward looking and open for new things and would go the next step into an ecological future as long as quality is good and prices reasonable. Modern Marketing would enhance the product's opportunities in the market place (e.g. organic apples wrapped in

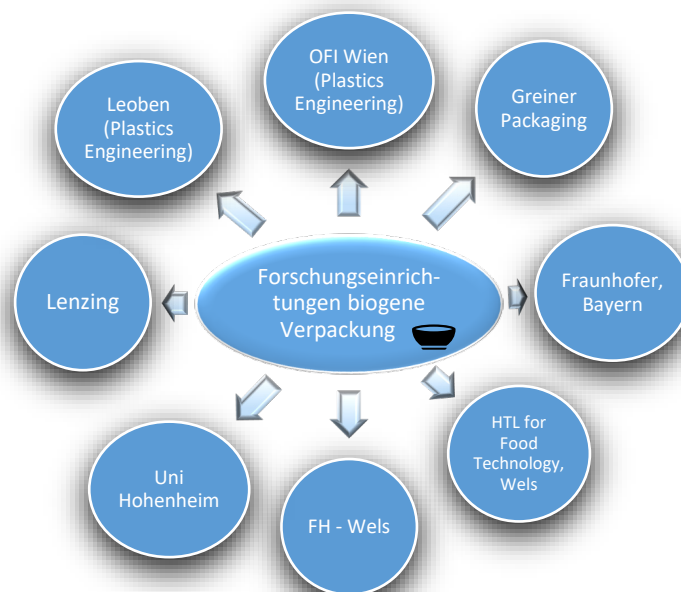
biodegradable packaging made from apple pomace could be marketed well and would attract more and more customers)

## 4.4 RESEARCH AND DEVELOPMENT

The trend towards biodegradable packaging is already visible today by the very fact that many different research institutions are making considerable efforts in this field. Nevertheless, a number of questions remain unanswered. This is because there is a large variety in packaging and there is an essential difference in packaging for fluids or foils or bagged goods.

Currently, cardboard packaging made from apple pomace has already been manufactured cost-effectively, fast and without further research. A mix of apple pomace cellulose with wood or cardboard cellulose for higher stability still needs to be evaluated. In South Tyrol they currently manufacture apple paper and sell it.

At the moment the key question is which raw material is best to manufacture disposable tableware and biodegradable packaging. Therefore, not only apple pomace quality is tested but also other biogenic side products. Inhomogeneous raw material still represents a major problem in order to ensure consistent standards of quality required for sale. Only standardized processes ensure economic working.



*Research institutions working on disposable tableware and biodegradable packing (according to RAB)*

As you can see in the graph experts are available in Upper Austria who are concerned with the topic. Most probably also R&D departments of packaging producers are doing research into biodegradable packaging.

Moreover, it must be evaluated whether and to what extent packaging material can be composted. Can it be composted in normal household waste? Which temperatures are needed? How long does it take to biodegrade the different products?

## 4.5 FUNDING AND LEGAL FRAMEWORKS

The EU and programmes on a national and regional level provide financial support by various funds in order to implement the business model. There are funds for basic research and product development of disposable tableware and biodegradable packaging and funds for market launch.

Regional universities can take over basic research into the matter. There are already some completed master theses (Master Thesis on Aronia Pomace – HBLA Elmerg – muesli bars, animal feed, fertilization) which shows the interest in the topic and could provide info for further research.

At the moment there are no specific rules in the legal texts which specify on packaging of bio-products. In the EU regulation on bio-farming (EU-Öko-VO 2092/91 Anhang 3.7.) only 'the packaging of products and transport to other businesses or units' is specified in greater detail. It is basically about regulating the labelling and traceability of products. Concerning biodegradable packing and composting of packaging reference is made to EU standard EN 13432.

The RAB Regional Advisory Board requests clear guidelines for alternative, biogenic packaging concerning limits. At the moment the existing rules are largely based on the current regulations on packaging made of polypropylene.

Funding – links:

The following link of the Austrian Chamber of Commerce provides all funding possibilities for businesses:

<https://www.wko.at/service/foerderungen.html?geltung%5B%5D=ooe&branche=3&fuer%5B%5D=0&art=0&textfilter=Lebensmittel#foerderdb-search-form>

Funding map from the regional government of Upper Austria: <https://www.land-oberoesterreich.gv.at/foerderungen.htm>

More info can be obtained via the funding portal:

<https://www.foerderportal.at/category/foerderungen/>

INDUSTRY MAGAZINE funding database: <https://industriemagazin.at/foerderungen>

Current funding programme of FFG: <https://www.ffg.at/foerderungen>

Investment fund services of Business Upper Austria: <https://www.biz-up.at/innovationsfoerderung/foerderberatung/>

Start Up funds: <https://www.tech2b.at/weitere-foerdermoeglichkeiten-fuer-startups>

Packaging regulation

2014: <https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20008902>

## 4.6 ADDITIONAL INFO AND INTERESTING FACTS FROM THE ONLINE WORKSHOP WITH THE RAB- REGIONAL ADVISORY BOARD

The available apple pomace is used for different things depending on quality and ingredients. Further processing for animal feed needs higher quality than the production of disposable tableware and biodegradable packaging. Not all apple pomace, however, is suitable for further processing for animal feed, it depends on the ingredients. This could increase competition among apple pomace producers when regional pomace is not enough and China produces much more apple juice. There is uncertainty over the question to what extent apple pomace import for production of biodegradable packaging is a sustainable alternative.

## 4.7 OVERVIEW TABLE

The table below was put together by the RAB – Regional Advisory Board based on their experience, assessment and know-how. The RAB consists of different persons from different fields so the table provides a good overview of the starting position in the regions. The definition “excessive/unproblematic” means the implementation of the business model is possible with very little effort or the framework is already available without further changes needed.

The definition “not enough/problematic” comprises all those sectors which still need further changes to implement the business model.

	Excessive/unproblematic	Enough	Medium	Not enough/problematic
Raw material in the region		✓		
Raw material producers in the region		✓		
Market, consumers		✓		
Rival products				✓
Retail, Sale		✓		
Project partners interested in business model		✓		
Prospective manufacturers and those who implement business model		✓		
Research institutions in the field of business model				✓
National research / national experts			✓	
International research / International experts		✓		
Legal framework				✓
Supporter of business model (stakeholders/fields/persons)			✓	
Regional funding			✓	
National funding			✓	

International funding	✓ (Research)			
Research funding			✓	
Product development funding			✓	
Market launch funding				✓



## GUIDELINES FOR THE LEGAL REPRESENTATIVES OF INTEREST GROUPS

Policymakers and legal representatives of interest groups not only influence judicial frameworks and laws, but also relevantly determine, in which direction a region is further developing. If innovations and visionary ideas reach implementation and fall on breeding ground, where they could grow, is not depending at last on the environment which is created by politics. With the help of strategy documents there is previously given direction to a common economic and research policy for a region. In this connection it is important for the decision makers to consider all aspects and keep an eye on them.

These guidelines appeal to politicians, chamber representatives and clusters. They give assistance and provide a basis for decision making at strategy decisions, especially in the area of bio- economy, which will have a higher significance in regional terms in the future.

### STRENGTHS OF THE REGION

On the basis of the table of the Regional Advisory Board (RAB) in the previous chapter it is clear to see, why it is obvious that bio-degradable packaging made from apple pomace has to be pushed in Upper Austria in the future. In many areas which are necessary for the start of the business model, the members of the RAB Regional Advisory Board are convinced that there are enough capacities here in the region of Upper Austria. Upper Austria is a region with a strong apple industry, both concerning the production areas and also the further processing of apples. All involved parties in the production chain, from the apple manufacturers to the juice manufacturers are interested in an additional added value of the apple pomace. They have appropriate connections and contacts to establish a network in which know-how can be configured in this field.

The environmental consciousness of the consumers is increasing exponentially and eco-friendly packaging is not only a trend in Upper Austria. More and more consumers demand ecological solutions and more and more companies are forced to present eco-friendly packaging. Upper Austria could have a pioneering task and be valid as a „Best Practice“ example for sustainable packaging. In addition, the desire of the consumers for regionality and regional products gets louder. Regionality and environmental protection go hand in hand. The demanding percentage of biological agriculture in Austria matched with bio-degradable packaging solutions or disposable tableware would boost Upper Austrian's economy.

Both in the Austrian bio-economy strategy and also in the Upper Vision, the development of bio-based materials for a permanent recycling economy is fixed. Therefore, it is a logical conclusion to support and push on the development of bio-degradable packaging and disposable tableware.

According to this it needs comparatively little effort to bring that business model on the way for marketability.

Currently indeed there are efforts made to develop biodegradable packaging and disposable tableware but so far apple pomace is irrelevant. This promising raw material for packaging in a region, in which fruit- growing is an important landscape component, would not only place

Upper Austria as a pioneer task in the sector of biodegradable packaging but would also be put on the market as a prestigious project for the region. Moreover, it would strengthen the position of Upper Austria as a place of business of important players in the field of packaging and save numerous jobs.

## RECOMMENDATIONS FOR THE STAKEHOLDERS

In order that the business model will be interesting for a company, not only a product has to be developed which is marketable, but also frameworks have to be created by politics, which relieve the implementation, respectively make it possible in many areas. In two workshops with important representatives of the relevant interest groups we discussed about the frameworks and conditions and defined where the key factors for the implementation for the business model are located. In further succession the recommendations were defined for politics, economy and environment, with their aid the business model of biodegradable packaging and disposable tableware can be a success.

### Political key factors:

- **The co-operation between politics and research is the determining factor.** The members of the provincial government for economy and research and the governor have to be informed and have to support the business idea. All political policy- makers have to agree on the idea.
- Positioning of the „Legal Representatives of Interests“ for the business idea of biodegradable packaging and disposable tableware made from apple pomace (Chamber of Agriculture, Chamber of Commerce).
- **The political will for a change** in the field of packaging industry and packaging of persistent materials has to be positioned and transferred.
- Good public relations have to attract a wide audience and has to convince them how important environmental protection is. The consumers have to be trained in realizing the additional benefit of bio-degradable packaging.
- **Commitment to regionality:** By political measures and funding guidelines, politics has to support the region and regional products much stronger than it has done until now.

### Economical key factors:

- **Resources:** The raw material apple pomace has to be available in the region (in Upper Austria). A far transport would neither be economical nor ecologically reasonable. Not only the primary product has to be available in appropriate quality and quantity, but also technology has to be developed and parallel skilled workers have to be trained. The basis for this progress has to be accompanied by politics and universities.
- **Budget:** For the implementation it needs suitable innovation sponsorship, both for the developing of the innovation and research and also for the market launch of the product.

### Social key factors:

- **Networking/ Cooperation:** The existence of a good network and co-operation partners is one of the factors of success.
- **Eco- social responsibility at the purchase decision:** It needs a sensitization of the consumers for regional products and biodegradable packaging. Right here in nursery schools and schools first pedagogical measures can be set. A wide public campaign for regionality and sustainable packaging makes sense, too.
- **Staff/Skilled workers (harvesters):** Harvesters are essential for this business model. It needs personnel which is also available in time of crisis. (e.g. problem with harvest workers during CoVid19 pandemic).
- **Education:** To get skilled workers it needs a suitable training in Upper Austria. It should be thought of an integration in course of instruction and degree programmes in various branches of study. The qualification for this business model has to be created in all ranks (technological....)

### Technical key factors:

- Both interdisciplinary collaboration between the different research institutions and with other specialist and also collaboration with entrepreneurs are preconditions. Without them the development of bio-degradable packaging cannot succeed.
- Technical staff is necessary which knows a lot about machines or are well versed in the process of manufacture. Besides, the trained personnel for serving the machines is needed, too. Appropriate vocational training (several modules) would be essential.
- New production facilities are necessary, if the existing machines are not convenient.
- Plastic material alternative packaging/tableware: The process of manufacturing has to be studied. First of all, it needs a procedure where a huge amount can be generated.

### Legal frameworks:

- **Non-bureaucratic licensing procedure:** Very important are non-bureaucratic licensing procedures. It would be a pity if Upper Austria as a pioneer region, which developed the idea and put energy and money in the implementation of this business idea, will not be first and another region will be earlier on the market with the product, due to long procedure and approval times.
- It requires an amendment of the Austrian compost ordinance in order to consider the product waste.
- There has to be a patent for the manufacturing process.
- A condition for the marketability is a product accreditation: Depending on biogenous packaging it needs diverse licences, in case if there is contact to the packed food or not.
- Sustainable packing, biodegradable packing solutions as well as disposable tableware are hardly considered in the Austrian laws. An amendment law has to respond to this new trend and has to expand into suitable laws in Austria. (Waste Management Act, Waste Framework Directive, Packaging Ordinance, Compost Ordinance).

## **GUIDELINES FOR SMALL AND MEDIUM-SIZED COMPANIES FOR IMPLEMENTATION OF THE BUSINESS MODEL**

In order to build up a successful business from the idea to the marketable innovation some steps are required. The following picture gives you a review of the most important facts to be taken into account for the implementation. You will find detailed data for availability of resources, possible business partners or supporting measures and framework directives in the first part of this guidelines. The pictured numbers and facts and figures support you with the first step to implement the business idea and enable first evaluation for raw material enquiry, environmental and market research.

# Roadmap







## START

1. You and your company want to develop further and you have decided to produce biodegradable packaging and disposable table ware, made from apple pomace? This roadmap guides you step by step from the choice of the business model until the market launch.
2. Be conscious of the range you want to open a market and research what amount and quality of apple pomace is available. Define your product with the aid of market research (disposable tableware, nets, cardboard boxes or foils?) and research details to the current state of technology to bring your investment directly on track. The consumers demand new solutions in the field of biodegradable packaging- analyse the spirit of the time and plan the implementation.
3. For the development of biodegradable packaging further research is necessary. Research of this project accompanied by the FH Wels has to be continued. Depending on the type of packaging, apple pomace has to be available in appropriate quality. An analysis of different apple pomace is indispensable. Search for corresponding partners for research and submit your project for a research funding.
4. Find the right partner for concretizing your ideas. In this document you will find a list of possible business partners which are already interested in bio- degradable packaging or currently work with it and do research, as well as research institutions which work on bio-degradable packaging.
5. Develop your product with the help of your partners. Therefore, the operational procedures have to be standardized. It has to be guaranteed that there are no fluctuations in quality in of the product.
6. Choose the right partner for the market launch. The first choice for the commercialization of disposable tableware would be „Business-to-Business“- „B2B“-business model. For example, standardized products could be sold and distributed by caterer suppliers and wholesalers. A second promising opportunity would be the „B2B“-marketing in collaboration with food producers which would like to use sustainable, alternative packaging materials.
7. Localize your relationship to you consumers and suppliers and enter the market together with your partners. Targeted market campaigns inform the customers and increase the market opportunities.
8. In co-operation with other companies and research institutions you and your company have developed further and an excellent and sustainable product enriches the market.



## SUCCESS





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## CONTACT

Anna Bäuerle ||| Project coordination ||| EU Interreg Project AlpBioEco ||| [alpbioeco@sigmaringen.de](mailto:alpbioeco@sigmaringen.de)

## PROJECT PARTNERS



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