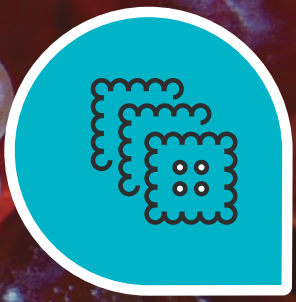
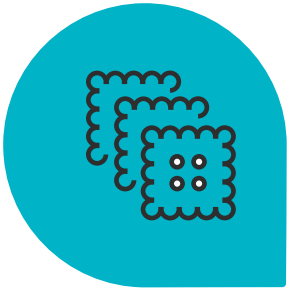
CIRCULAR ECONOMY GUIDELINES

CIRCULAR ECONOMY POLICY PACKAGE FOR THE FOOD/BIOMASS SECTOR



Circular Economy Policy Package for the Food/Biomass Sector



This publication is a summary of the R2Pi deliverable 7.1.1 which presents the full Circular Economy Policy Package for the Food/Biomass Sector, and can be referred to for further details.

The opinions expressed in this document are the result of the joint work of the R2Pi consortium and stakeholders but are not necessarily supported in their entirety by all parties involved.

TABLE OF CONTENTS

About the R2Pi Project 5

Food/Biomass Circular Economy Business Models (CEBMs) 6

CEBMs of Food/Biomass Companies from the Case Studies 6

Circular Economy Policy Packaging for the Food/Biomass Sector ... 8

Policy Packaging: Aim and methodology 8

Basic Package for the Food/Biomass Sector 10

Effective Package for the Food/Biomass sector 11

A Glance at the Food/Biomass Policy Package 13

The Effective Policy Package for The Food/Biomass sector 13

Conclusions 19

ABOUT THE R2PI PROJECT

The **R2Pi project: The route to circular economy**, a three-year research project, was launched in October 2016 under the European Commission's Research and Innovation programme, Horizon 2020. Its overarching goal is to accelerate the widespread implementation of a circular economy, based on successful business models and effective policies. The aim is therefore to develop circular business models **(CEBMs)** and guidelines that will facilitate this transition and to propose policy packages supporting these sustainable models.

The Circular Economy (CE) is defined by R2Pi as follows: "In a circular economy, the value of products and materials is maintained, waste is avoided, and resources are kept within the economy when a product has reached the end of its life."

R2Pi research is focused on the application of CEBMs in six sectors: Construction, Electronics, Food, Plastics, Textile, and Water. This pamphlet describes the Food sector.

Along with the business case studies, which exposed CEBMS, **the Circular Economy Policy Package** is a key product of the R2Pi Project. The Food Policy Package is based on the project's accumulated knowledge about the transition towards the CE and contributes to the development of policies to promote CE linking economic growth and social prosperity, while promoting the efficient use of resources, through the facilitation of CEBMs.

Please see the R2Pi Website, "Sectors" section, for the key results of the case studies on: ECF Farmsystems GmbH (ECF), Lentura, Phenix and Bioelektra.

FOOD/BIOMASS CIRCULAR ECONOMY BUSINESS MODELS (CEBMs)

In the EU, around 88 million tonnes of food is wasted every year (1/3 of produced food) throughout the entire supply chain. Customers, food production and processing sector, catering sector, as well as wholesale and retail sectors share in this waste. The reduction of food waste can bring many benefits for example financial (lower costs of collection and disposal of waste), social (new workplaces) and environmental (reduction of green-house gases generated during production, distribution and landfill disposal).

CEBMs seek to address these problems (to some extent). The aim is to implement innovations and new initiatives that reduce the consumption of resources and try to keep products, their parts and materials in use for as long as possible.

CEBMs of Food/Biomass Companies from the Case Studies

The R2Pi project conducted several case studies that are related to the Food/Biomass Sector:

ECF Farmsystems GmbH (ECF) is an aquaponic food/ bio-oriented production organisation based in Germany, which engages in the sale of potted herbs to supermarkets, and sale of fish to supermarkets and restaurants. In production, material flows are exchanged between the aquaculture and the hydroponic operations, enabling co-product recovery and industrial symbiosis to take place. Lately, ECF is also engaging in Build — Own — Operate (B-O-O) aquaponic farms (co-management of plants).

Lentura is an agro-ecological production organization based in Spain, and operates a direct sales model whereby produce is sold to school canteens and farmers' market, as well as managing a subscription model for box schemes to households (as the most important channel). Lentura offers products with a renewable main material base that is easily reintegrated into biological cycles (circular sourcing). Furthermore, both livestock excreta and the packaging used in products / activities are recovered and reused as inputs for new production cycles (co-product recovery).

Phenix is a French company operating in the food waste sector which has set up a digital platform that works as an intermediary connecting waste suppliers (mainly retailers) and waste receivers (mostly charities). Through this service, Phenix prevents food, which is close to expiration date, from being wasted, and turns such waste into food donations. Phenix operates a Platform-based CEBM based on circular sourcing — when working for charities, Phenix sources food products among retailers' unsold goods. It also engages in co-product recovery — food unsuitable for human consumption is turned into other products as energy or animal food — and resource recovery. When working for retailers, Phenix reduces waste and unsold products by channelling them towards charities.

Bioelektra in Poland operates in the waste management industry, specifically recycling mixed municipal waste using an innovative mechanical-heat waste treatment (MHT), where up to 96% of municipal solid waste stream is recycled with no need of separate collection. As suppliers of recycled materials, Bioelektra is applying a circular sourcing type of CEBM.

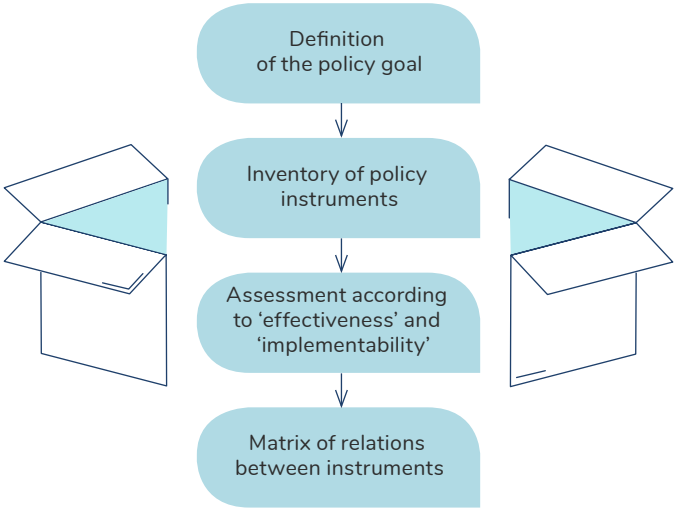
CIRCULAR ECONOMY POLICY PACKAGING FOR THE FOOD/BIOMASS SECTOR

Policy Packaging: Aim and methodology

A Policy Package is a combination of policy instruments designed to address one or more policy objectives. Through a combination of policy instruments, a Policy Package should result in meeting goals that otherwise cannot be met with a single policy instrument. Policy Packages utilize positive synergy effects between policy instruments while avoiding contradictory effects and reducing negative unintended effects. They are also designed to increase public acceptance of policies — social acceptability — and to achieve political compromises — political acceptability. Thus, **Policy Packages facilitate both (1) effectiveness and (2) implementability of the desired policy goals.**

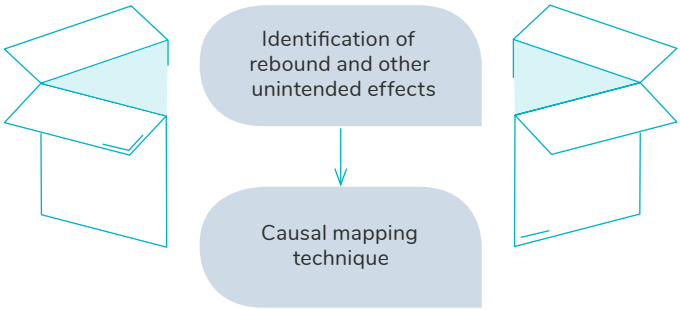
In order to design a Policy Package, several stages of development and refinement are defined. Initially, a "Basic Package" of policy instruments is created. The Basic Package is designed in order to directly achieve the desired policy goals. It is the result of a process in which many individual policy instruments are assessed based on their characteristics of 'effectiveness' and 'implementability'. Based on these characteristics, the most promising instruments are identified. Then, pre-conditions to the implementation of these promising instruments are identified, as well as instruments which may facilitate the effects of these policy instruments, or have synergetic effects with them. Finally, potential contradictions among instruments are identified. Based on these elements, the Basic Package is formed.

Figure 1: Basic Package for the food/ biomas sector



At the second stage, the "Effective Package" formulation, primary and ancillary instruments are removed and added, respectively, to enhance the net effectiveness of said package. This is done to maximize the benefits of the Policy Package, while taking into account rebound and other unintended effects. To do this, causal mapping is used, a technique which (graphically) illustrates the mechanisms through which a policy instrument may affect the policy goal and by that process anticipate unintended effects. In addition, insights produced are validated via expert interviews.

Figure 2: The Effective Package for the food/ biomas sector



Basic Package for the Food/Biomass Sector

The process of designing the Basic Package for the Food/Biomass sector followed a series of steps in which 75 Policy Instruments were outlined, scored (according to 'effectiveness' and 'implementability' criteria) and reviewed (according to their relevance for EU member states).

The inventory of policy instruments was created in order to achieve the policy goal of promoting the uptake of Circular Economy Business Models (CEBMs) for the European food/biomass sector resulting in:

- Decreased food waste at every stage of its life cycle – from production to consumption
- Improved management of food waste / biomass

- Enhanced industry standards for appropriate level of food waste in relation to output/sales
- Improved value chain collaboration to resolve system-level problems

The inventory of policy instruments was then reduced to a list of the 19 policies with the best potential for being effective and implementable. Based on the scores for each policy instrument 'Low-Hanging Fruit' were identified to establish the Basic Package. 'Low-Hanging Fruits' are easy to implement and effective instruments. Then, a Matrix, to identify relationships between pairs of instruments (synergies, pre-conditions, facilitation and contradictions) was created. Contradictory instruments, identified by the Matrix were eliminated in the second phase of this process that aimed at grouping policy instruments and identifying patterns.

Effective Package for the Food/Biomass sector

Each proposed policy instrument for the Basic Package may have unintended effects that will erode or eliminate its actual net effectiveness with respect to the defined policy goal. Therefore, a causal mapping technique was used to anticipate these unintended effects and mitigate them by adding supporting ancillary policy instruments or removing instruments from the Basic Package. Ancillary instruments were considered in order to facilitate the function of one or more policy instruments and thus affect the policy goals indirectly by facilitating implementation.

With the above aims in mind, the Effective Package was created based on the modifications to the Basic Package. In essence, the causal mapping, with inputs from experts and stakeholders, led to the identification of policy instruments that should be added, removed or modified. The result of this process was the Effective Package which is comprised of policy measures organized into the following **five** themes: **integration** (measures cutting across the value chain), **investment** (government investment), **command and control** (regulatory), **market-based** (financial incentives / disincentives) and **encourage-voluntary** (measures to encourage stakeholders to police their own behavior).

A GLANCE AT THE FOOD/BIOMASS POLICY PACKAGE

The Effective Policy Package for the Food and Biomass sector

Based on the above analysis and combined with our experts' judgment, as well as inputs from extensive fieldwork, the following Effective Policy Package* was designed: The effective package organized into the 5 themes mentioned showing synergetic and facilitation relationships, respectively (Figures 3 & 4).

No	Policy Measures
3	Implementing signage indicating typical number of people who could eat the packaged portion in one meal.
7	Standardized signage for thr information concerning food storage (e.g. middle of he refrigerator, top of the freezer).
41	Implementing good Samaritan law concerning food at the EU level.
27	Obligation to propose an option to choose the portion of a dish at food services (hospital buffets, school canteens, restaurants etc.) with effect on price.

73	EU platform with regional sub-platforms for selling non-standard products (unsuitable for the market due to e.g. signage mistakes, lower amount of products in the package).
20	Obligatory visible signs inside the fridge on product arrangement.
14	Informational campaigns for animal owners on type of wasted food that could be given to certain pets.
43	Obligation for the retailers to have a working relationship with food bank/charity on food donations.
11	Deregulation of food in regard to its standardization in size and shape (especially vegetables, fruit).
53	Implementing an EU platform for connecting agriculture market (specifically vegetal producers with animal producers to better handle biomass).
22	Obligatory reusable packages for frozen food in freezers.
1	Adding additional information to standard signage (e.g. using “best before, not necessarily bad after” marking).
37	EU ban on garbage disposal units in restaurants and households.

76	Comprehensive educational campaigns on food and food waste reduction (including promotion of buying locally grown products) for various groups of consumers.
77	Ban on “Buy one get two free” promotions (the amount bought should be linked to prices).
78	Educational campaigns for employees (food service, including canteens, healthcare and HORECA sectors) on food waste prevention and food waste management.
79	Binding food waste reduction targets and bio-waste recycling targets supported by clear guidelines and measurement methods.
80	Increase funding for organisations supporting food waste redistribution and organizing educational campaigns aimed at food waste reduction.
81	Adapting Common Agriculture Policy and Common Fisheries Policy rules to include conditionalities and objectives on food losses and to prevent food waste linked to economic reasons.
82	Incentivising the sale of unpacked food whenever possible in order to allow consumers to only buy the quantity of a product that they really need.
83	Providing EU innovation funds for advanced food storage management to encourage “First In First Out (FIFO)” management and yield management on stored foods, by using for example IoT/RFID technology.