



# SUSTAINABILITY ON AIP



## SUSTAINABILITY

Sustainable development “meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Three elements of sustainable development are of equal importance - economic, social and environmental.

Active and intelligent packaging solutions tackle sustainability in a variety of interesting ways, depending on where the interaction takes place in the full packaging value chain.

This leaflet explains various sustainability aspects and benefits and challenges related to active and intelligent packaging.

## WHAT IS ACTIVE AND INTELLIGENT PACKAGING?

**Active packaging** is intended to extend the shelf life or to maintain or improve the condition of packaged food. It is designed to deliberately incorporate components that would release or absorb substances into or from the packaged food or the environment surrounding the food.

**Examples:**

- Oxygen, moisture or ethylene scavengers
- CO<sub>2</sub>/antioxidant emitters
- Adaptors

*See our leaflet on active packaging for more information.*

**Intelligent packaging** refers to packaging systems that can inform and/or interact with the consumer about the quality, nature or production history of the packed product.

**Examples:**

- Oxygen sensors
- Temperature and time-temperature indicators
- Freshness indicators
- Interactive packaging

*See our leaflet on intelligent packaging for more information*

## WHAT IS SUSTAINABLE PACKAGING?

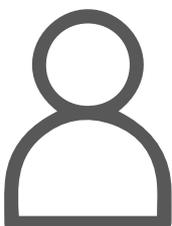
The Sustainable Packaging Coalition states that packaging is sustainable if it:

- is beneficial, safe & healthy for individuals and communities throughout its life cycle
- meets market criteria for both performance and cost
- is sourced, manufactured, transported, and recycled using renewable energy
- is manufactured using clean production technologies and best practices
- is made from materials healthy in all probable end-of-life scenarios
- is physically designed to optimize materials and energy
- is effectively recovered and utilized in biological and/or industrial closed loop cycles

*Source: <https://sustainablepackaging.org/about-us/>*

## SUSTAINABILITY ASPECTS OF ACTIVE AND INTELLIGENT PACKAGING

### SOCIAL



### ENVIRONMENTAL



### ECONOMIC



# SUSTAINABILITY ASPECTS OF ACTIVE AND INTELLIGENT PACKAGING

## OPPORTUNITIES

## CHALLENGES



- » Extended shelf life of packed products (especially food) leads to less waste
- » Promotion of more responsible food consumption
- » Possibility of minimising health hazards (lower risk of food poisoning)
- » More attractive, engaging and interactive products

- » Are consumers aware of active and intelligent packaging - do they know what it is, how it works and how to dispose it?
- » Will consumers accept active and intelligent packaging - are they willing to use it and perhaps pay more for it?



- » Reduced land required to produce food (because less food is wasted)
- » Reduced use of resources (water, energy, pesticides) to produce food (because less food is wasted)
- » Cleaner transport options in logistics due to longer shelf life

- » What materials and processes are best for manufacture of A&I packaging?
- » What is the whole life cycle environmental impact of A&I packaging? Do benefits outweigh challenges?
- » What are the end-of-life options for A&I packaging? Is it easy to collect, sort and safe to recycle?



- » Marketability of "extended shelf life"
- » Increased sales from better looking products
- » Decreased logistics costs from longer product storage
- » Decreased peaks of availability may lead to increased financial gains during off-peak season

- » Cost-benefit analysis needed for each opportunity
- » Are substances for production of A&I packaging readily available?
- » Is infrastructure investment needed for production of A&I packaging?

## HOW CAN SUSTAINABILITY BE ASSESSED?

### WHAT?

Sustainable development has to be present in all life cycle stages of a product:

- » demand for sources
- » production processes
- » processing methods
- » packaging
- » delivery chain
- » distribution
- » use and waste management including transport

Sustainable products should match or exceed conventional products in functional and quality properties, fulfill today's environmental protection standards, and also contribute to waste management systems.

### HOW?

Unfortunately there isn't one framework to assess full sustainability yet, however there are a number of methods, concepts and good practices including:

- » Life Cycle Assessment (LCA) – standardised tool for evaluating environmental sustainability within whole life cycle of a given product (ISO 14040)
- » Product Environmental Footprint (PEF),  
via <http://ec.europa.eu/environment/eussd/index.htm>
- » Tools for environmental management and certification (EMAS),  
via [http://ec.europa.eu/environment/emas/index\\_en.htm](http://ec.europa.eu/environment/emas/index_en.htm)
- » Tools for sustainable design (e.g. eco-design)
- » Ecological footprinting (carbon footprint, water footprint)
- » Other non-obligatory environmental certification systems



For more information scan the QR code on the left!

## ABOUT ACTINPAK

COST FP1405 ActInPak aims to identify and overcome the key technical, social, economic and legislative barriers to a successful deployment of renewable fibre-based functional packaging solutions such as active and intelligent packaging. Currently, 43 countries are involved in the network, with participants representing 209 academic institutions, 35 technical centers, and 83 industrial partners. For more information, please visit the ActInPak website: [www.actinpak.eu](http://www.actinpak.eu)

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