Creating opportunities within H2020

Bologna, 7 March 2014

DAI RIFIUTI UN'OPPORTUNITÀ DI BUSINESS:
ESPERIENZA DI SIMBIOSI INDUSTRIALE IN EMILIA ROMAGNA

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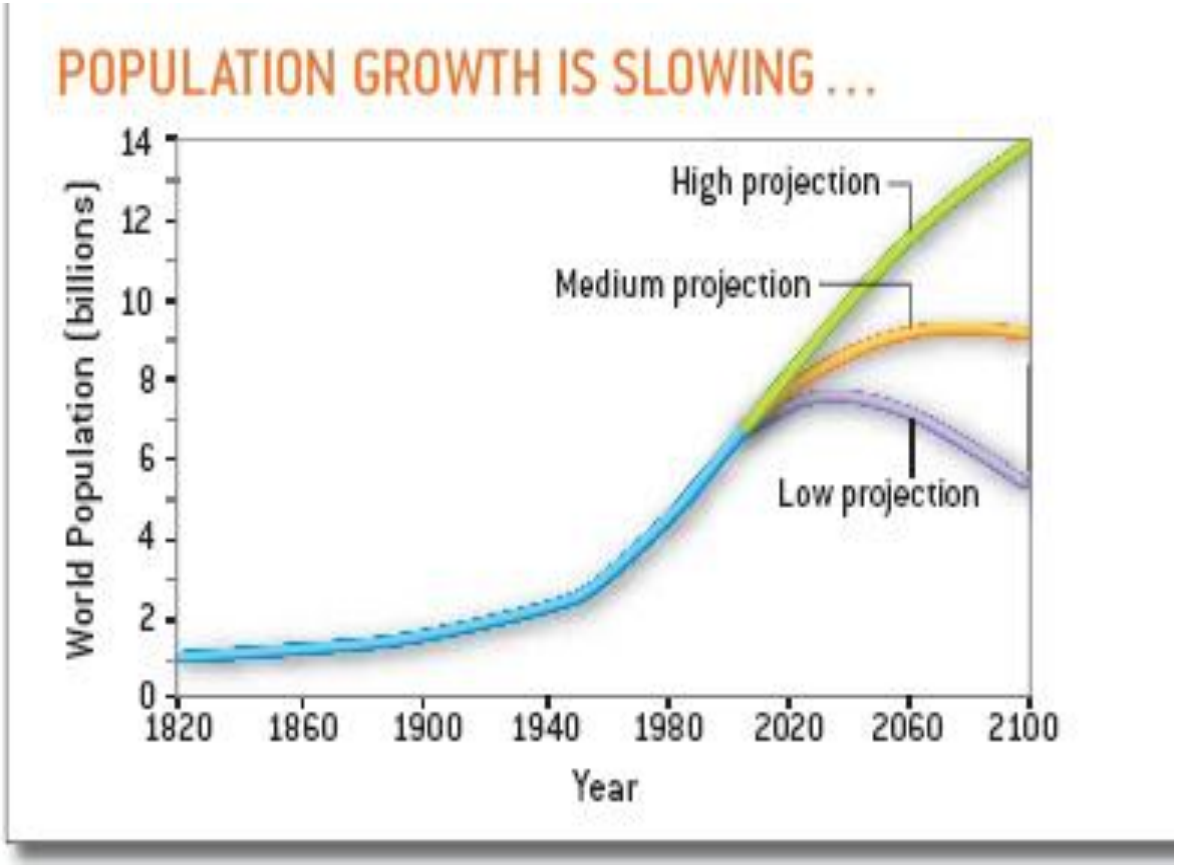
100 years of living science

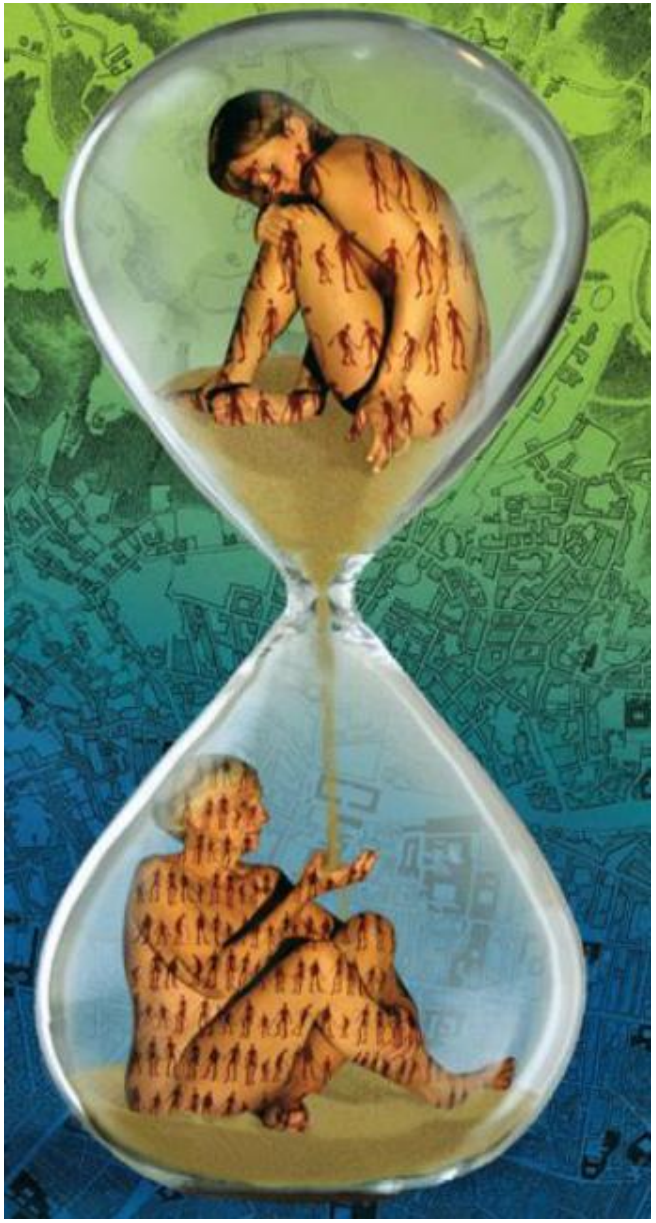
Contents

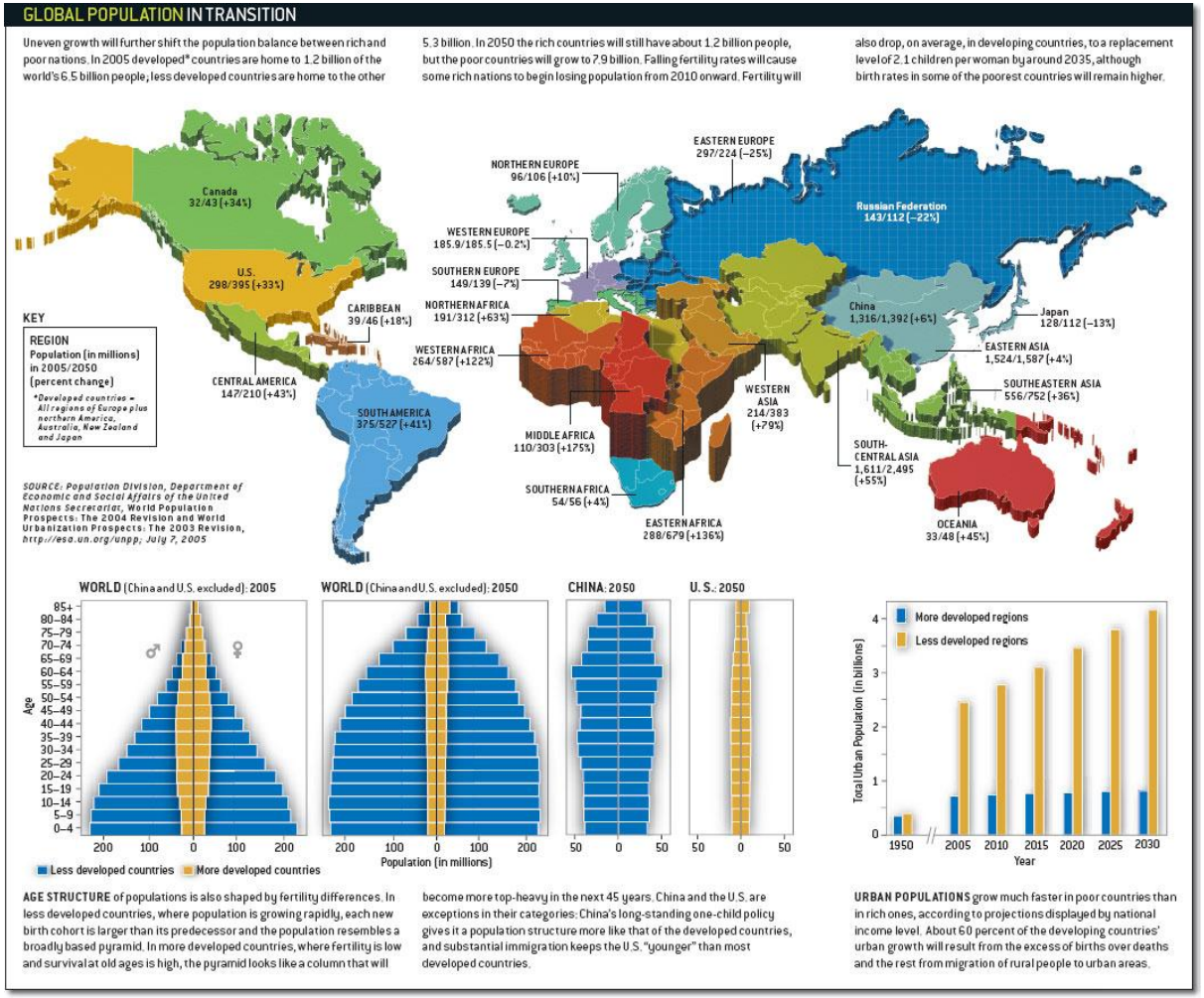
What do the world, the EU and E-R have in common?



Europe losing manufacturing to low-cost world regions. Need to specialise in high-tech, high-quality, innovative export products.

What do the world, the EU and E-R have in common?





What do the world, the EU and E-R have in common?

What do the world, the EU and E-R have in common?

World population is urbanised

-> **China became more urban than rural in 2011**

BRIC and fast-developing economies acquiring western diets

-> **Luxury / Western illnesses are on the rise:**

Obesity	Diabetes	Cancer
Heart disease	Hypertension	Depression

The Resource Efficiency Imperative

PUSHING THE LIMIT

Allowing environmental processes to exceed certain limits could have serious repercussions, but decisive actions can keep the processes within safe bounds. [For more, see "Solutions to Environmental Threats," starting on page 58.]

ENVIRONMENTAL PROCESS	CONSEQUENCES IF SURPASSED	POSSIBLE SOLUTIONS
Biodiversity loss	Land and ocean ecosystems fail	Slow land clearing and development; pay for ecosystem services
Nitrogen cycle	Freshwater and ocean dead zones expand	Reduce fertilizer use; process animal waste; switch to hybrid vehicles
Phosphorus cycle	Ocean food chains are disrupted	Reduce fertilizer use; process animal waste; process human waste better
Climate change	Polar ice and glaciers melt; regional climates shift	Switch to low-carbon energy and fuels; put a price on carbon emissions
Land use	Ecosystems fail; carbon dioxide escapes	Limit urban sprawl; improve farm efficiency; pay for ecosystem services
Ocean acidification	Microorganisms and corals die; carbon sink lessens	Switch to low-carbon energy and fuels; reduce fertilizer runoff
Freshwater use	Aquatic ecosystems fail; water supplies disappear	Improve irrigation efficiency; install low-flow appliances
Stratospheric ozone depletion	Radiation harms humans, animals and plants	Phase out hydrochlorofluorocarbons; test effects of new chemicals

Foley (2010) Scientific American

What do the world, the EU and E-R have in common?

Emilia Romagna plus partners = high-value intermediates and products to address those needs!

Product	Residues [%]
Fish filets	50 – 75
Wine	20 – 30
Fruit and vegetable juice	20 – 30
Vegetable oil	40 – 70
Sugar beet	86
Potato starch	80
Olive oil - [Antioxidants in press cake]	***98 !***

Klock and Noke (2008) Veredelungsprodukte aus Resstoffen der Lebensmittelverarbeitung

Carotenoide

lycopine;

Oleuropein;

hydorxytyrosol;

Flavonoid

What is in Horizon 2020? *Themes & Logistics*

W-1: € 10 M

W-2: € 9 M

W-7: € 7 M

Research & Inno:
Funding rate: 100%

Innovation :
Funding rate: 70% (except for non-profit legal entities, where 100% applies)

Engaging society, reaching end users, linking with policy makers for participative governance of the bioeconomy (Crdntn & Spt - 2014-06-26)

Bridging research and innovation for a sustainable bioeconomy (Crdntn & Spt - 2014-06-26)

Biomarkers for nutrition and health (ERA-NET Co-fund - 2015-06-11)

Waste 1 – Moving towards a circular economy through industrial symbiosis (Inno - 2014-04-08 & 2014-09-16)

Waste 2 – A systems approach for the reduction, recycling and re-use of food waste (Rsch & Inno - 2014-04-08 & 2014-09-16)

Waste 7 – Ensuring sustainable use of agricultural waste, co-products and by-products (Rsch & Inno - 2014-10-16 & 2015-03-10)

What is required in W-1

ELEMENTS in call

1 Manage waste material flows
2 Harmonised data (composition, supply patterns)
3 Civil society involvement

4 increase life-spans, enable re-use
5 Design for recyclability
6 Involve SMEs / social innovation

TECHNIQUES to use

1 Substance Flow Analysis
2 Databases for Symbiosis

3 Consumer associations / departments of health
4 Product and process re-design
5 Design for recyclability
6 Social innovation
7 New standards validated by industrial stakeholders

What is required in W-2

ELEMENTS in call	TECHNIQUES to use
1 Whole food system	1 LCA & MFA
2 Safety, sustainability, cost, risks of components of food waste	2 Phytosanitary elements
3 New feeds and foods	3 Biorefining and nutritionist
4 Recyclable materials	4 Materials function analysis
5 Valuable molecules	5 Nutritional chemistry
6 Socio-economic dimension of food waste	6 Socio-economic
7 Include participants from China	7 Include participants from China

What is required in W-7

ELEMENTS in call

1 Co-/by-products, e.g. the wine sector (no more on straw!)
2 Manure and effluents = valuable bio-products
3 New processes enabling innovative uses, also outside the agricultural sector
4 Innovative approaches for efficient use of agricultural waste
5 Sustainable value chains in farming (incl. organic sector).
6 Sector-specific case-studies
7 Knowledge platforms
8 Include participants from China

TECHNIQUES to use

1 ER
2 Phytosanitary elements

3 Biorefining and nutritionist
4 Materials function analysis
5 Nutritional chemistry
6 Socio-economic

7 Include participants from China

What is in a successful proposal?

Complementarity; Must-haves

	Eligibility conditions[6,7]
Research & innovation action	At least three legal entities. Each of the three shall be established in a different Member State or associated country. All three legal entities shall be independent of each other.
Innovation action	At least three legal entities. Each of the three shall be established in a different Member State or associated country. All three legal entities shall be independent of each other
Coordination & support action	At least one legal entity established in a Member State or associated country.
SME instrument	At least one for-profit SME[8]. Only applications from SMEs established in EU Member States or countries associated to Horizon 2020[9]; No concurrent submission or implementation with another phase 1 or phase 2 project[10].

First impact, then Excellence then Implementation

What is in a successful proposal?

Type of action	Excellence	Impact	Implementation
All types	Clarity and pertinence of the objectives; Credibility of the proposed approach.	The expected impacts listed in the work programme	Coherence of the plan, appropriateness of the allocation of tasks, resources and management; Complementarity of the participants;
R & I	Soundness of the (trans-disciplinary) concept; Ambition; Innovation potential; Beyond the state of the art; ground-breaking objectives, novel concepts & approaches	Enhance innovation capacity; Integrating new knowledge; Strengthening competitiveness by satisfying European and global markets; Potential to exploit and disseminate	Risk and innovation management

Complementarity; Must-haves

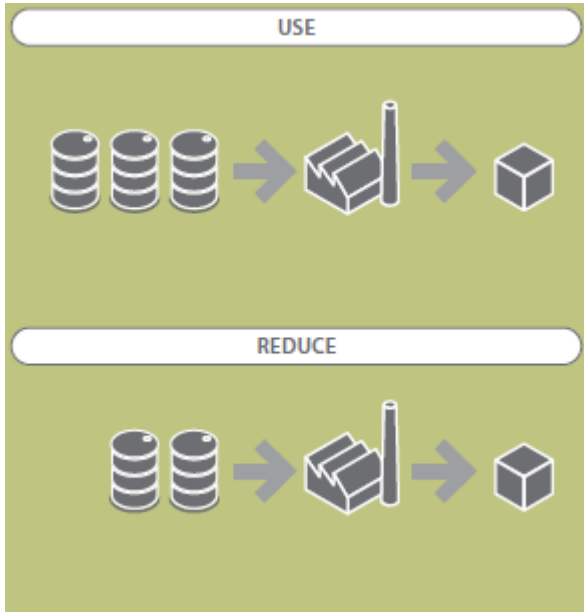
Europe 2020 Resource-efficient Europe Flagship – particularly: by 2020 waste will be managed as a resource – the Eco-innovation Action Plan, the Communication 'Innovating for sustainable growth: a bioeconomy for Europe', the Raw Material Initiative strategy and the European Innovation Partnership on Agricultural Productivity and Sustainability.

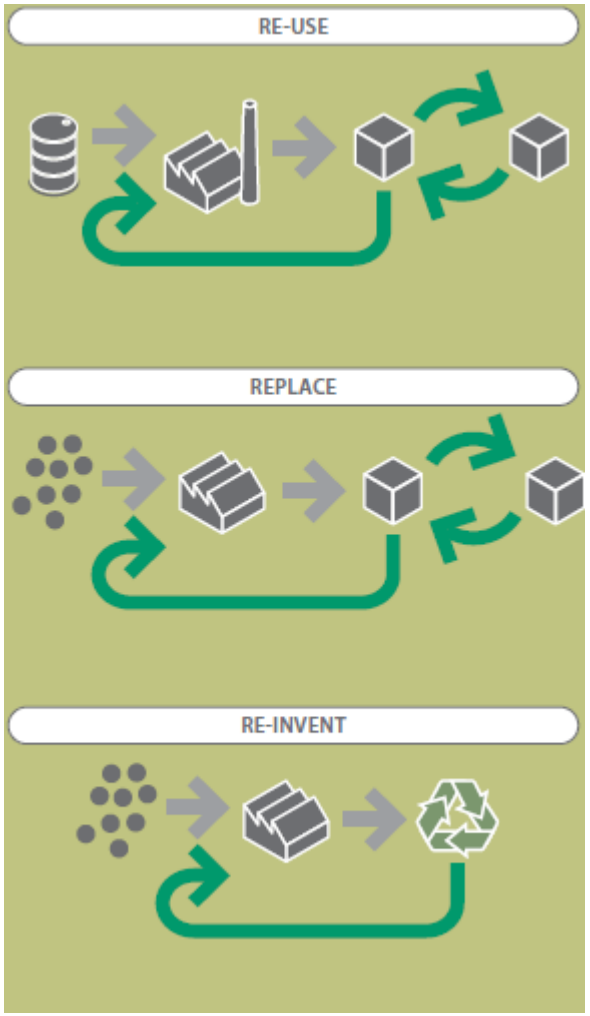
The Public-Private Partnerships on Sustainable Process industries and on Bio-Based Industries will contribute to the objective of this focus area.

Proposals shall include a draft exploitation and dissemination plan – not required for the first stage of two-stage procedures.

Operational capacity
A curriculum vitae of those responsible for carrying out the research and/or innovation;
A list of up to 5 relevant publications, and/or products, services or other achievements;
A list of up to 5 relevant previous related projects
A description of any significant relevant infrastructure

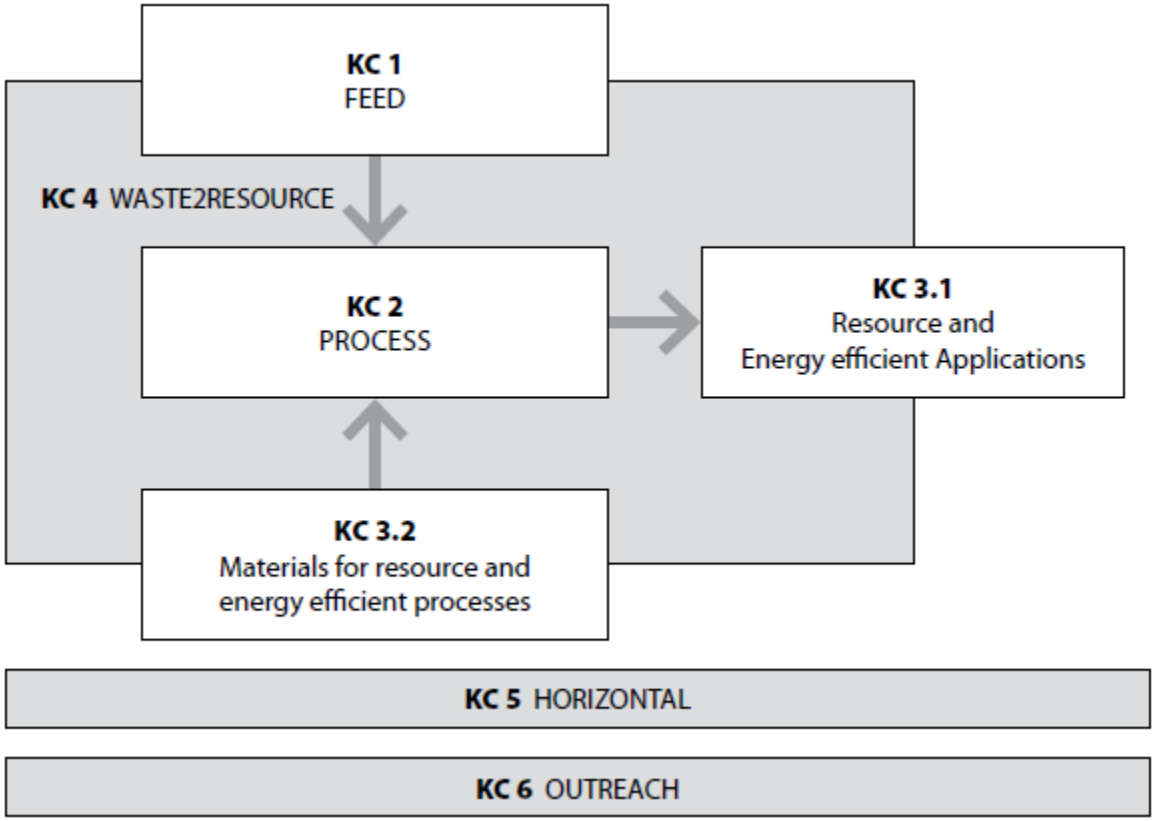
Complementarity; Must-haves SPIRE





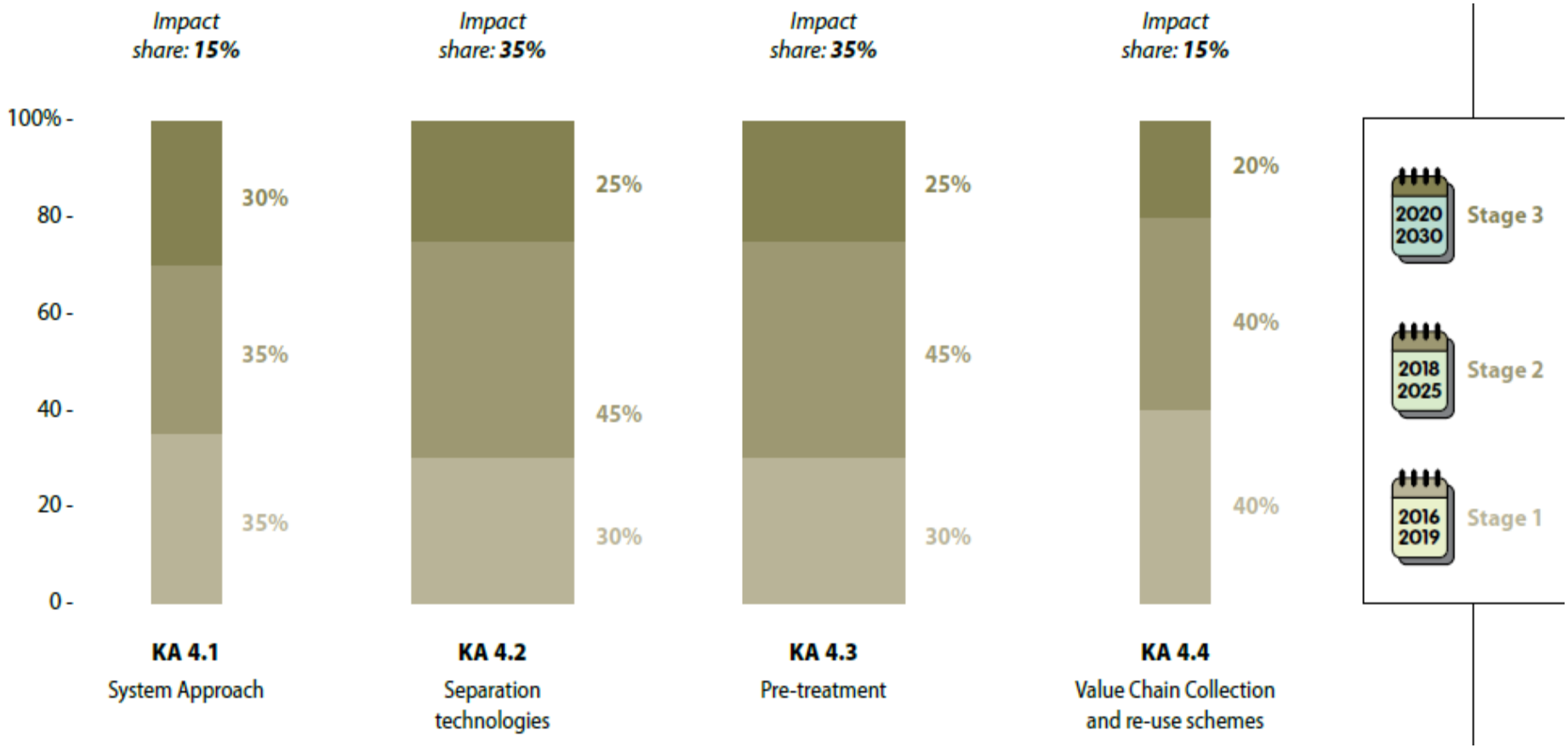
WASTE2RESOURCE: Avoidance, valorisation and re-use of waste streams within and across sectors, including recycling of post-consumer waste streams and new business models with the ambition to closing the loop.

Complementarity; Must-haves SPIRE



- KA 4.1: Systems approach: understanding the value of waste streams
- KA 4.2: Technologies for separation, extraction, sorting and harvesting of gaseous, liquids and solid waste streams
- KA 4.3: Technologies for (pre)treatment of process and waste streams (gaseous, liquids, solids) for re-use and recycling
- KA 4.4: Value chain collection and interaction, reuse and recycle schemes and business models

Complementarity; Must-haves SPIRE



What is in a successful proposal?
Example Nutraceuticals

Examine Co- and By- products

1 Demand as raw material?

2 Demand as intermediate chemical or final product?

3 Respond to global trends

Omega 3 fatty acids

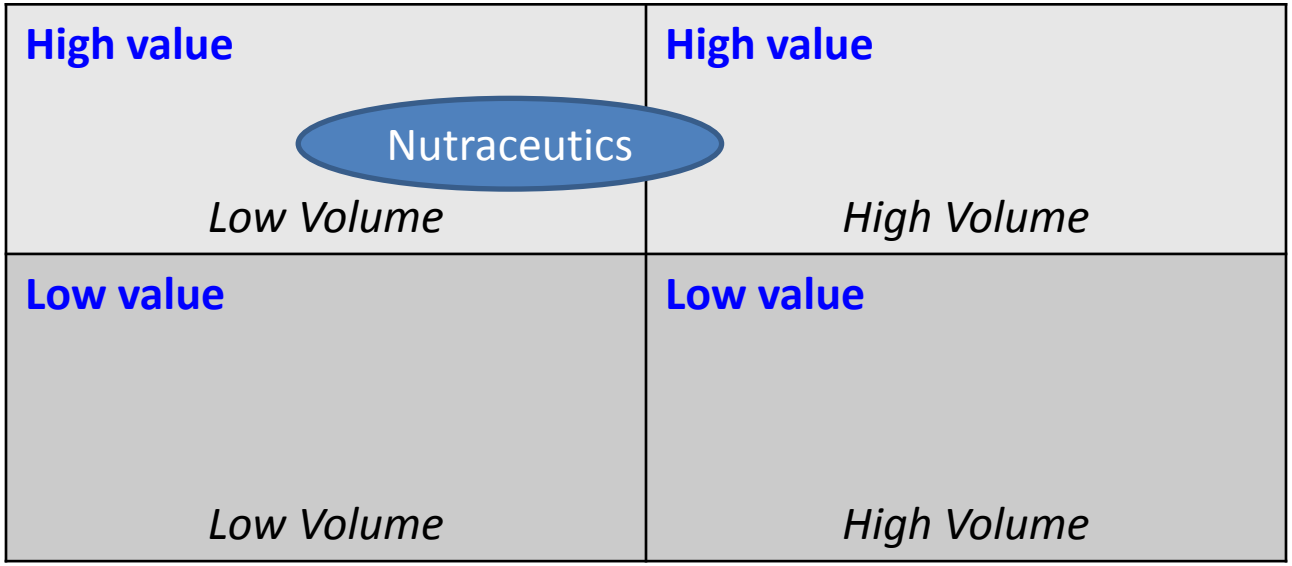
Antioxidants

Anti-viral

Anti-fungal

What is in a successful proposal?

Example Nutraceuticals



Large markets

Fertilisers
Chemical feedstocks
Paper industry
Cosmetics

What is in a successful proposal?

Example Nutraceuticals

Omega 3 Market Could Be Worth $4 billion by 2018

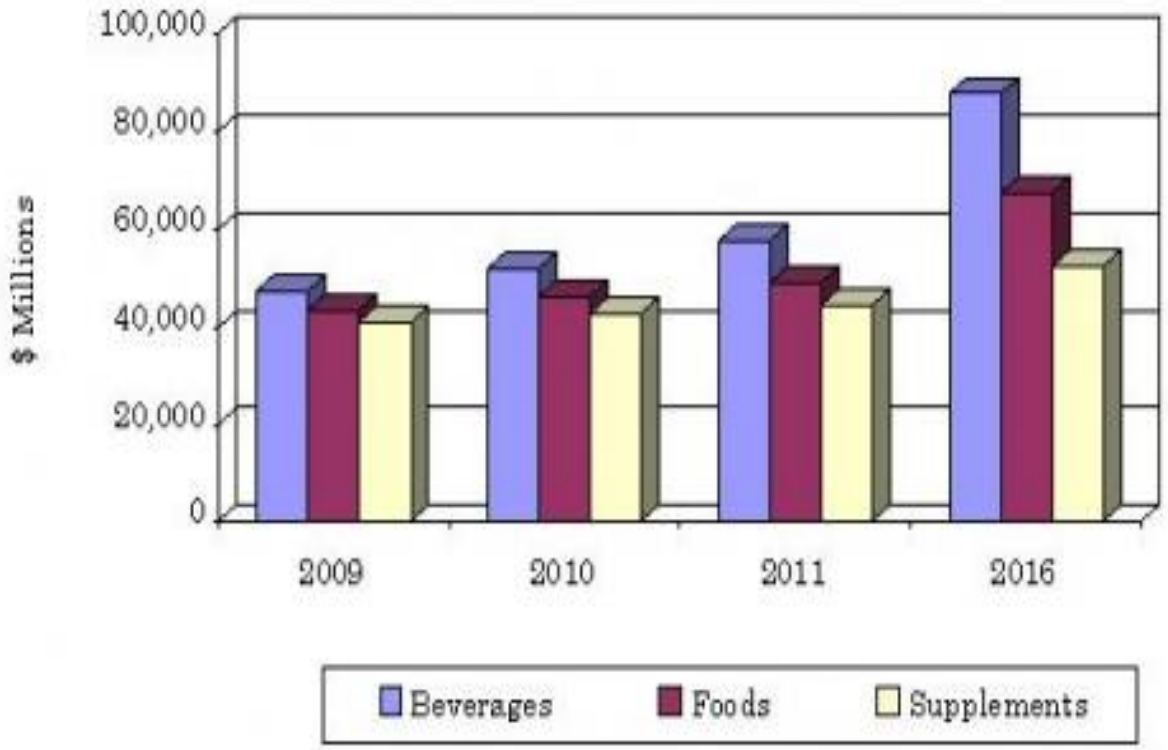
The global nutraceuticals product market reached $142.1 billion in 2011 and is expected to reach $204.8 billion by 2017

US sales reach $75.3 billion by 2017

Asia-Pacific (including Japan) is expected to have the second largest market share after North America by 2017.

What is in a successful proposal?

Example Nutraceuticals



What is in a successful proposal?

Example Nutraceuticals

Substance	Occurrence	High-value property
Terpene limonoids	Peels and membranes of citrus fruits	Anticarcinogenic
Ferulic acids	Seeds of brown rice, whole wheat and oats, apple, artichoke, orange, peanut & pine apple	Antioxidant, anticancer
Lycopene	Tomatoes, pink grapefruit, watermelon, guava, papaya	Reduces risk of prostrate cancer in males
Naringin	Grapefruit	Reduces cholesterol
Quercitin	Red onions, buckwheat, red grapes, green tea, apple skins	Anti- sitaminic, antioxidant

Deployment

Reach-Green China

Imperial College London

Chemical Eng	Civil Eng
Process Systems	CEP

Medium chemical company?

Medium Vegetable processors?

Pharmaceutical?

UTRECHT SUSTAINABILITY INSTITUTE

Fraunhofer IWES

fre energy

WAGENINGEN UR For quality of life

I.A.R. Department of Processing and Recycling

RWTH AACHEN UNIVERSITY

Thank you

Let's roll up our sleeves

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