Innovation and KETs within Horizon 2020.

A Spanish perspective and opportunities for the Agrofood Sector

José Manuel González
Spanish KBBE Representative.
CDTI.- Ministry of Economy and Competitiveness.
EU’s R&D Framework Programme Department.
✈ +34 91 581 55 62.- josemanuel.gonzalez@cdti.es

S3 Thematic Workshops. KETs on Agrofood.
Murcia, 11th April, 2013

– Under the Ministry of Economy and Competitiveness (R&D competences)
– Funding Agency focussed on enterprise’s innovation.

CDTI’s Mission: Increase the competitive edge of Spanish companies by raising their technological level

**Nationally**

- RTDI project evaluation, support and funding (soft loans and grants)
- Funding of new technology-based companies (NEOTEC y NEOTEC Venture Capital)

**Internationally**

- Management of international technology cooperation programs (R+D Framework Programme, Eureka, Iberoeka, Chineka…)
- Support for transfer of technology abroad (External Network)
Innovation and KETs within Horizon 2020 - Agrofood Sector

HORIZON 2020 – Framework Programme for Research & Innovation

HORIZON 2020 – STRUCTURE (based on EC’s proposal 30.11.2011)

Societal Challenges

- Health demographic change and well-being
- Food security, sustainable agriculture, marine and maritime research and the bio-based economy
- Secure, clean and efficient energy
- Smart, green and integrated transport
- Climate action, resource efficiency and raw materials
- Inclusive, innovative and secure societies

Industrial Technologies

- Leadership in enabling & industrial technologies
  - Information & Communication Technologies (ICT)
  - Nano-technology
  - Advanced materials
  - Biotechnology
  - Advanced manufacturing systems
  - Space
- Access to risk finance
- Innovation in SMEs

Excellent Science

- European Research Council
- Future & Emerging Technologies (FET)

European Institute of Innovation and Technology (EIT)

- Marie Curie Actions
- Research Infrastructures

(11/04/2013)


### Innovation and KETs within Horizon 2020 - Agrofood Sector

**HORIZON 2020 – Framework Programme for Research & Innovation**

#### BUDGET

<table>
<thead>
<tr>
<th>Prioridad «Ciencia excelente»</th>
<th>79,271</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. El Consejo Europeo de Investigación (CEI)</td>
<td>24,598</td>
</tr>
<tr>
<td>2. Las Tecnologías Futuras y Emergentes (FET)</td>
<td>13,268</td>
</tr>
<tr>
<td>3. Las acciones Marie Curie</td>
<td>3,100</td>
</tr>
<tr>
<td>4. Las infraestructuras de investigación</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prioridad «Liderazgo industrial»</th>
<th>17,938</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Liderazgo en tecnologías industriales y de capacitación:</td>
<td></td>
</tr>
<tr>
<td>1.1 Tecnologías de la información y la comunicación (TIC)</td>
<td>13,781</td>
</tr>
<tr>
<td>1.2 Nanotecnologías, 1.3 Materiales avanzados y 1.5 Fabricación y transformación avanzadas</td>
<td>7,939</td>
</tr>
<tr>
<td>1.4 Biotecnología</td>
<td>3,797</td>
</tr>
<tr>
<td>1.6 Espacio</td>
<td>509</td>
</tr>
<tr>
<td>2. Acceso a la financiación de riesgo</td>
<td>1,536</td>
</tr>
<tr>
<td>3. Innovación en las PYME</td>
<td>3,538</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prioridad «Retos sociales»</th>
<th>31,748</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salud, cambio demográfico y bienestar</td>
<td>8,033</td>
</tr>
<tr>
<td>2. Seguridad alimentaria, agricultura sostenible, investigación marina y marítima y bioeconomía</td>
<td>4,152</td>
</tr>
<tr>
<td>3. Energía segura, limpia y eficiente</td>
<td>5,782</td>
</tr>
<tr>
<td>4. Transporte inteligente, ecológico e integrado</td>
<td>6,802</td>
</tr>
<tr>
<td>5. Acción por el clima, eficiencia de los recursos y materias primas</td>
<td>3,160</td>
</tr>
<tr>
<td>6. Sociedades inclusivas, innovadoras y seguras</td>
<td>3,819</td>
</tr>
</tbody>
</table>

**Instituto Europeo de Innovación y Tecnología (EIT)**

- **Acciones directas no nucleares del Centro Común de Investigación (JRC)**

**EURATOM (2014-2018)**

- **Precios constantes a 2011 en M€**

**OVERALL BUDGET**

**UNDER DISCUSSION!!!**

(11/04/2013)
**Boosting cutting-edge biotechnologies as future innovation drivers**

- Development of **emerging tools** (synthetic biology, bioinformatics, systems biology).
- Exploiting the **convergence with other enabling technologies** such as nanotechnology (e.g. bionanotechnology) and ICT (e.g. bioelectronics).
- Transfer & implementation into **new applications** (drug delivery systems, biosensors, biochips).

**Biotechnology-based industrial processes**

- Enabling the European industry (e.g. chemical, health, mining, energy, pulp and paper, textile, starch, food processing) to **develop new products and processes** meeting industrial and societal demands;
- **Biotechnology-based alternatives** to replace established ones;
- Potential of biotechnology for detecting, monitoring, preventing and removing pollution (enzymatic and metabolic pathways, bio-processes design, advanced fermentation, up- and down-stream processing, dynamics of microbial communities);
- Development of **prototypes** for assessing the techno-economic feasibility of the developed products and processes.

**Innovative and competitive platform technologies**

- Develop **platform technologies** (genomics, meta-genomics, proteomics, molecular tools);
- Development of **bio-resources with optimised properties** and applications beyond conventional alternatives;
- Exploration, understanding and exploitation in a sustainable manner of **terrestrial and marine biodiversity** for novel applications;
- Biotechnology-based **healthcare solutions** (diagnostics, biologicals, bio-medical devices).
Innovation and KETs within Horizon 2020 - Agrofood Sector

HORIZON 2020 – BIOECONOMY Societal Challenge

Agriculture and Forestry
- Production systems
- Ecosystem services
- Policies and Rural Develop
- Forestry

Marine Resources
- Fisheries
- Aquaculture
- Marine Biotechnology

Food
- Consumers
- Nutrition
- Food industry

Bio-Industries
- BioIndustries
- Biorefinery
- Market for bioproducts

HORIZON 2020 – BIOECONOMY Societal Challenge

Increasing production efficiency, climate change, sustainability and resilience
- Adaptive capacity of plants, animals and production systems
- Use of biomass and by-products from agriculture and forestry for non-food applications.
- Efficient resource use (water, nutrients, energy) & ecological integrity of rural areas.
- Genetic improvement of plants and animals for adaptation and productivity traits.
- On-farm soil management for increasing soil fertility as a basis for crop productivity.
- Animal and plant health, integrated disease/pest control measures
- Eradication of animal diseases, research on antimicrobial resistance, animal welfare.

Providing ecosystem services and public goods
- Delivering commercial products and societal public goods (including cultural and recreational value) and important ecological services (biodiversity, pollination, water regulation, landscape, erosion reduction and carbon sequestration / GHG mitigation).
- Management solutions, decision-support tools. Management of agricultural systems

Empowerment of rural areas, support to policies and rural innovation
- Development opportunities for rural communities (primary production and delivery of eco-systems services, new and diversified products (food, feed, materials, energy))
- Cohesion of rural areas and prevent economic and social marginalisation, foster diversification of economic activities (including service sector).
- Support policy makers in the implementation of relevant strategies, policies & legislation
- Socio-economic and comparative assessment of farming/forestry systems

Sustainable forestry
- Sustainable produce bio-based products and sufficient biomass.
- Consideration of economic, ecological and social aspects.
- Resource efficient forestry systems. Forest resilience and biodiversity protection.
Developing sustainable and environmentally-friendly fisheries

- In depth understanding of marine ecosystems (new insights, tools and models to improve understanding of what makes marine ecosystems healthy and productive)
- Evaluate and mitigate the impact of fisheries on marine ecosystems (including deep sea).
- The socio-economic effects of management options will be measured.
- Effects and adaptation to environmental changes, including climate change.
- Genetic and dynamics of fish populations, on the role of key species in the ecosystems, on fishing activities
- The shared use of maritime space with other activities, in particular in the coastal zone, and its socio-economic impact will also be addressed.

Developing competitive European aquaculture

- Development of healthy, safe and competitive products
- Domestication of established species and diversification for new species
- Interactions between aquaculture and aquatic ecosystems, effects of climate change on systems in inland, on the coastal zone and offshore.
- Understanding the social and economic dimensions of the sector to underpin cost and energy efficient production.

Boosting marine innovation through biotechnology

- Discovery of new species and applications in the field of marine biotechnologies, which is foreseen to generate a 10% annual growth for this sector.
- Explore and exploit marine biodiversity and aquatic biomass to bring new innovative services on the markets with potential applications in sectors including chemical and material industries, pharmaceutical, fisheries and aquaculture, energy supply and cosmetic.
Informed consumer choices
- Consumer preferences, attitudes, needs, behaviour, lifestyle and
- Communication between consumers and the food chain research
- Improve informed choice, sustainable consumption and their impacts on productivity, inclusive growth and quality of life, especially of vulnerable groups.

Healthy and safe foods and diets for all
- Nutritional needs and the impact of food on physiological functions and performance.
- Links between diet, ageing, chronic diseases and disorders and health.
- Dietary solutions and innovations leading to improvements in health and well-being.
- Chemical and microbial food and feed contamination, risks and exposures.
- Food safety innovations, improved risk communication tools.

A sustainable and competitive agri-food industry
- Needs for the food and feed industry to cope with social, environmental, economic change from local to global.
- Food design, processing, packaging, process control, waste reduction, and the safe disposal of animal by-products.
- Innovative and sustainable resource-efficient processes.
- Diversified, safe, affordable and high quality products.
- Traceability, logistics and services, socio-economic factors, the resilience of the food chain against environmental and climate risks.
- Limitation of negative impacts of food chain activities and of changing dietary production systems on the environment.
Fostering the bio-economy for bio-based industries
- Major progress towards low carbon, resource efficient and sustainable industries.
- Discovery and exploitation of terrestrial and aquatic biological resources, minimising adverse environmental impacts.
- Potential trade-offs between the various uses of biomass.
- Development of bio-based products and biologically active compounds for industries and consumers with novel qualities, functionalities and improved sustainability.
- Economic value of renewable resources, bio-waste and by-products will be maximised through new and resource efficient processes.

Developing integrated biorefineries
- Bioproducts, intermediates and bioenergy/biofuels (cascade approach)
- Technologies and strategies will be developed to assure the raw material supply.
- Types of biomass for use in second and third generation biorefineries, including forestry, biowaste and industrial by-products

Supporting market development for bio-based products and processes
- Demand-side measures will open new markets for biotechnology innovation. Standardisation (determination of bio-based content, functionalities and biodegradability).
- Methodologies and approaches to life-cycle analysis need to be further developed and continuously adapted to scientific and industrial advances.
- Research activities supporting product and process standardisation and regulatory activities in the field of biotechnology are considered essential for supporting the creation of new markets and for realising trade opportunities.
Innovation and KETs within Horizon 2020 - Agrofood Sector
HORIZON 2020 Vs 7th Framework Programme (KBBE)

Agriculture
- Enabling Research
- Production systems
- Animal health and production
- Support to Policies

Food
- Consumers
- Nutrition
- Food processing
- Food quality and safety
- Environmental impact
- ERA

Biotechnology
- Biomass
- Marine Biotechnology
- Industrial Biotechnology
- Biorefinery
- Environmental Biotechnology
- Emerging trends in Biotechnology

(11/04/2013)
Innovation and KETs within Horizon 2020 - Agrofood Sector

KETs. Linking R&I with TRL. Could it be agreed?

LINKING R&I WITH TRLs. SOME IDEAS AND COMMENTS.

<table>
<thead>
<tr>
<th>TRL</th>
<th>FP &amp; H2020</th>
<th>R&amp;I</th>
<th>Facilities / Pillar</th>
<th>Funding H2020??</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ERC, Basic Research</td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>2-4</td>
<td>Technological Research projects</td>
<td>RTD</td>
<td>Academic / I</td>
<td>100%</td>
</tr>
<tr>
<td>5-7</td>
<td>Development, Demo projects &amp; Trials</td>
<td>Innovation / Closed to market</td>
<td>Pilot lines / II</td>
<td>70%*</td>
</tr>
<tr>
<td>8-9</td>
<td>Deployment</td>
<td>Innovation &amp; market replication</td>
<td>Industrial 7 III</td>
<td>BEI &amp; Structural</td>
</tr>
</tbody>
</table>

- **TRL** are not designed to explicitly take account of systems design, configuration, integration and implementation and manufacturing aspects, so therefore, its coverage can be fully dependant on the application sector.

- It is not clear the straight forward identification of higher **TRL (5-7) with very large projects**: this may not make sense in all /any application sectors.

- H2020 funding for “close-to-market” actions at the current agreed rate (70/25) may not be suitable for projects targeting higher **TRL (8-9). BEI loans** could better fit this kind of deployment investments.
CLOSE TO MARKET ACTIONS

“Close-to-market action’ means an action primarily consisting of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication; Council PGA.

Funding. One project-one rate

• Same rate for all beneficiaries and all activities in the grant*.
• The rate is fixed ex-ante in the WP (not negotiated per project).
• Up to max 70 % funding for direct costs for actions close-to-market.
• A fix flat rate of 25% for indirect costs for all actions.

*For close-to-market actions, as an exception to paragraph 3 of this Article, the Horizon 2020 grant may reach a maximum of 100% of the total eligible costs for non-profit legal entities, without prejudice to the co-financing principle. Council PGA.

• H2020 funding for “close-to-market” actions at the current agreed rate (70/25) may not be suitable for projects targeting higher TRL (8-9). BEI loans could better fit this kind of deployment investments.
### KBBE Calls 2007-12. Financial Return per COUNTRY.

<table>
<thead>
<tr>
<th>Country</th>
<th>Activities</th>
<th>Socios</th>
<th>Particip.</th>
<th>Subvención</th>
<th>2007-2011 %</th>
<th>%UE27</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nº</td>
<td>Nº</td>
<td>Nº</td>
<td>Euros</td>
<td>% UE27</td>
<td></td>
</tr>
<tr>
<td>Reino Unido</td>
<td>296</td>
<td>62</td>
<td>250</td>
<td>184.073.579</td>
<td>13,6%</td>
<td>15,4%</td>
</tr>
<tr>
<td>Alemania</td>
<td>279</td>
<td>48</td>
<td>281</td>
<td>154.364.745</td>
<td>11,4%</td>
<td>12,9%</td>
</tr>
<tr>
<td>Holanda</td>
<td>256</td>
<td>51</td>
<td>159</td>
<td>142.799.861</td>
<td>10,5%</td>
<td>12,0%</td>
</tr>
<tr>
<td>Francia</td>
<td>238</td>
<td>48</td>
<td>186</td>
<td>120.759.071</td>
<td>8,9%</td>
<td>10,1%</td>
</tr>
<tr>
<td>Italia</td>
<td>249</td>
<td>34</td>
<td>192</td>
<td>106.026.967</td>
<td>8,0%</td>
<td>9,1%</td>
</tr>
<tr>
<td>España</td>
<td>220</td>
<td>27</td>
<td>227</td>
<td>103.707.526</td>
<td>7,6%</td>
<td>8,7%</td>
</tr>
<tr>
<td>Belgica</td>
<td>178</td>
<td>32</td>
<td>128</td>
<td>78.373.736</td>
<td>5,8%</td>
<td>6,6%</td>
</tr>
<tr>
<td>Dinamarca</td>
<td>132</td>
<td>18</td>
<td>68</td>
<td>57.765.020</td>
<td>4,3%</td>
<td>4,8%</td>
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<tr>
<td>Suecia</td>
<td>116</td>
<td>10</td>
<td>54</td>
<td>46.505.109</td>
<td>3,4%</td>
<td>3,9%</td>
</tr>
<tr>
<td>Suiza</td>
<td>108</td>
<td>6</td>
<td>65</td>
<td>41.925.904</td>
<td>3,1%</td>
<td>0,0%</td>
</tr>
<tr>
<td>Finlandia</td>
<td>80</td>
<td>13</td>
<td>41</td>
<td>37.847.329</td>
<td>2,8%</td>
<td>3,2%</td>
</tr>
<tr>
<td>Noruega</td>
<td>73</td>
<td>8</td>
<td>56</td>
<td>30.717.147</td>
<td>2,3%</td>
<td>0,0%</td>
</tr>
<tr>
<td>Austria</td>
<td>80</td>
<td>9</td>
<td>67</td>
<td>29.621.681</td>
<td>2,2%</td>
<td>2,5%</td>
</tr>
<tr>
<td>Irlanda</td>
<td>73</td>
<td>5</td>
<td>37</td>
<td>27.538.314</td>
<td>2,0%</td>
<td>2,3%</td>
</tr>
<tr>
<td>Grecia</td>
<td>88</td>
<td>11</td>
<td>47</td>
<td>22.963.641</td>
<td>1,7%</td>
<td>1,9%</td>
</tr>
<tr>
<td>Portugal</td>
<td>73</td>
<td>6</td>
<td>55</td>
<td>20.904.167</td>
<td>1,5%</td>
<td>1,8%</td>
</tr>
<tr>
<td>Otros</td>
<td>---</td>
<td>10</td>
<td>768</td>
<td>148.593.614</td>
<td>11,0%</td>
<td>4,8%</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>398</strong></td>
<td><strong>398</strong></td>
<td><strong>2.681</strong></td>
<td><strong>5.590</strong></td>
<td><strong>1.356.487.411</strong></td>
<td>100,0%</td>
</tr>
<tr>
<td><strong>Total UE 27:</strong></td>
<td><strong>1.192.313.839</strong></td>
<td><strong>87,9%</strong></td>
<td><strong>100,0%</strong></td>
<td></td>
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</tbody>
</table>
KBBE Calls 2007-12. Financial Return per ACTIVITY & YEAR.
KBBE Calls 2007-12. Overall Financial Return per ACTIVITY

1. AGRO
   - 12 Coord. 9.6%
   - 7 Coord. 9.1%
   - 8 Coord. 7.4%
   - 27 Coord. 8.7%

2. FOOD
   - 12 Coord. 45.04
   - 7 Coord. 33.16
   - 8 Coord. 25.23

3. BIOTECH
   - 27 Coord. 103.71

TOTAL:

Budget (M€):
- 12 Coord. 539 M€ (40%)
- 7 Coord. 408 M€ (30%)
- 8 Coord. 394 M€ (29%)
- 27 Coord. 1.356 M€ (100%)

Retorno (% UE-27):
- 1. AGRO 4.0%
- 2. FOOD 2.2%
- 3. BIOTECH 1.5%
- TOTAL: 4.7%
Innovation and KETs within Horizon 2020 - Agrofood Sector
KBBE. PRELIMINARY RESULTS (2007-2012)


FP6 48M€

Financial Return (€)

Russia
Germany
France
Italy
Spain
Belgium
Denmark
Sweden
Switzerland
Finland
Norway
Austria
Ireland
Greece
Portugal
Others

Innovation and KETs within Horizon 2020 - Agrofood Sector

MORE OPPORTUNITIES: SMEs INSTRUMENT in H2020

**Phase 1: Concept and feasibility assessment**
- Feasibility of concept
- Risk assessment
- IP regime
- Partner search
- Design study
- Pilot application intention
- Business plan II

Lump sum: approx. 100 k€
EC funding 6-12 Months

**Phase 2: R&D, Demonstration, market replication**
- Development, prototyping, testing
- Piloting innovative processes, products and services
- Miniaturisation/design of products
- Plan & develop scaling-up
- Market replication
- Business plan III

Cost reimbursement:
1 to 3 M€ EC funding.
12 -24 Months

**Phase 3: Commercialisation**
- Quality label for successful projects.
- Facilitate access to private finance.
- Support via networking, training, coaching, information, addressing i.e. IP management, knowledge sharing, dissemination

No direct funding

**Mentoring and coaching scheme for beneficiaries SMEs**

*Only SME can apply for funding and can form collaborations according to their needs, including the subcontracting of R&D work.*

**SME window in the EU financial facilities (debt and equity facility)**
Innovation and KETs within Horizon 2020 - Agrofood Sector

MORE OPPORTUNITIES: SMEs INSTRUMENT in H2020

**Phase 1: Concept and feasibility assessment**
- Feasibility of concept
- Risk assessment
- IP regime
- Partner search
- Design study
- Pilot application intention
- Business plan I

**Phase 2: R&D, Demonstration, market replication**
- Development, prototyping, testing
- Piloting innovative processes, products and services
- Miniaturisation/design of products
- Plan & develop scaling-up
- Market replication
- Business plan II

**Phase 3: Commercialisation**
- Quality label for successful projects.
- Facilitate access to private finance.
- Support via networking, training, coaching, information, addressing i.e. IP management, knowledge sharing, dissemination

**Idea/Concept = Business plan I**
- Lump sum: approx. 100 k€
- EC funding 6-12 Months
- Common calls several times a year or open calls FIFO

**Phase 2:**
- Evaluations done by independent industrial-investor biased panel
- Budget: 1/2 of 20% SME target or PE amendment?
- Preferably managed CENTRALLY.

**Phase 3:**
- Early involvement of financial intermediaries may ease phase 3 funding
- Professional coachers at the choice of SMEs to exit H2020

**Cost reimbursement:**
- 1 to 3 M€ EC funding.
- 12 - 24 Months

**With preference**
- Quality label for successful projects.
- Facilitate access to private finance.
- Support via networking, training, coaching, information, addressing i.e. IP management, knowledge sharing, dissemination

**No direct funding**
- Complementary to SME instrument

**SME window in the EU financial facilities (debt and equity facility)**

Mentoring and coaching scheme for beneficiaries SMEs

(11/04/2013)
Thanks for your attention!

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