THE PORTUGUESE BIOECONOMY LANDSCAPE

BRUNO SOMMER FERREIRA

Bio-based Industries Public-Private Partnership – Portuguese Stakeholder Event

Lisboa – 18th December 2013
OUTLINE

• P-Bio
• Biotrend and Silicolife
• Bioeconomy requirements
• Portuguese (current) assets
  • Knowledge-base
  • Raw material availability
  • Infrastructure
P-Bio

- P-Bio was founded in 1999
- Currently has more than 30 members, representing more than 50% of biotech companies
- Promote the networking and synergies between biotech companies operating in Portugal
- Improve awareness of biotechnology
- Promote the adoption of national policies which foster the development of the biotech sector
- www.apbio.pt
Each bubble represents a biotech company. The size of the bubble represents the number of employees: 10 employees.

The areas of activity are represented by different colours:
- Healthcare & Medical
- Bioprocess Technology
- Marine
- Agro-Food
- Environment
- Technology Transfer

Lisboa – 18th December 2013
• Bioprocess development company founded 2000

ist spin-off

• Specialized in industrial biotechnology
• Runs a state-of-the-art facility for development, optimization and scale-up of bioprocesses
BIOTREND

- Service provider in bioprocess development
- Development of new technologies
- Keeps at the forefront of scientific development
- Seven on-going FP7 projects in the bioeconomy space

www.biotrend.biz
SILICOLIFE

• Founded in 2010
• *In silico* rational design of microbial cells
• Serves leading chemical, materials and synthetic biology companies
• Based on world-class science and technology
• Participates in one FP7 project and in two ERA-IB projects

www.silicolife.com
REQUIREMENTS FOR THE BIOECONOMY

- Knowledge base
- Raw materials
- Infrastructure

A plethora of products:

- Food additives
- Biopolymers
- Fuels & Chemicals
- And more, much more…

Lisboa – 18th December 2013
REQUIREMENTS FOR THE BIOECONOMY

Knowledge base

• Plant improvement
• Microbial strain improvement
• Biocatalyst optimization
• Bioprocess engineering

Raw materials

• Availability
• Logistic of supply

Infrastructure

• Research
• Demonstration
• Biomass production
• Processing
PORTUGAL: Knowledge-base

- Education and research
- Exponential growth of PhD’s in biotech topics [about 20% of total]
- International cooperation [ex. EU, US, Brazil]
PORTUGAL: Knowledge-base

- Ratio of biotech publications vs. total publications in Portugal above EU average
- Patents, impressive development!
PORTUGAL: Participation in EU projects

- Statistics of **KBBE** projects
- Proposals: 2943 total EU 568 with PT
- Approved: 507 total EU 107 with PT
- Success rate: 17.2% total EU 18.8% with PT

<table>
<thead>
<tr>
<th>Financing to PT entities</th>
<th>Higher education</th>
<th>10 056 215 €</th>
<th>✔️</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large companies</td>
<td></td>
<td>41 919 €</td>
<td>!!!</td>
</tr>
<tr>
<td>SMEs</td>
<td></td>
<td>9 660 288 €</td>
<td>✔️</td>
</tr>
<tr>
<td>Research centers</td>
<td></td>
<td>10 265 041 €</td>
<td>✔️</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>855 121 €</td>
<td>✔️</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>30 878 584 €</td>
<td></td>
</tr>
</tbody>
</table>

Lisboa – 18th December 2013
PORTUGAL: Participation in EU projects

Lisboa – 18th December 2013
PORTUGAL: Lignocellulosic raw-material

Forest occupies 39% of Portuguese territory
Accounts for ~6% of Portuguese exports

Species:
- Pine, 28%
- Eucalyptus 23%
- Cork 23%

Products:
- Pulp and paper
- Cork and derivatives
- Wood panels
- Furniture

Lisboa – 18th December 2013
PORTUGAL: Established biorefining capacity and supply chains

Lisboa – 18th December 2013
PORTUGAL: Examples of available residues

Lignocellulosic residues and by-products
- agriculture
- forestry

Cheese whey

Glycerol
by-product of biodiesel

Wastewater sludge
PORTUGAL: A sea of opportunities

Possible extension in the Portuguese Continental Shelf

40x surface of continental Portugal

Huge diversity of ecosystems

Untapped biodiversity and potential new bioactivities
PORTUGAL: Coverage of the value chain

Renewable raw material  Biocatalyst  Process  Product

Lisboa – 18th December 2013
PORTUGAL: Infrastructure in place

• Raw-material

• Genomics, systems biology

• Process development

• Demonstration scale
  Up to 100 m³
PORTUGAL: And the EU bioeconomy showcase

European Forum for Industrial Biotechnology and the Biobased Economy

2008
Brussels

2009
Lisbon

2010
Edinburgh

2011
Amsterdam

2012
Dusseldorf

2013
Brussels

Biotrend and P-Bio co-organizers

Silcolife sponsor

P-Bio media partner

Lisboa – 18th December 2013