

## **“University - Enterprise Cooperation” in Biosystems Engineering : an ERABEE Thematic Network European survey**

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## The first survey : POMSEBES questionnaire

This survey about the “University - Enterprise Cooperation” in the area of Biosystems Engineering is based on the replies of a sample of enterprises to a specific questionnaire.

This survey is the development of a first attempt done within POMSEBES (Policy Oriented Measures in Support of the Evolving Biosystems Engineering Studies in USA – EU) project.

The given replies of that survey were rather homogeneous and showed a common policy :

a great interest for Biosystems Engineering discipline could be drawn, while a good employability for the related graduates and a profitable University - enterprise co-operation could be foreseen.



## **ERABEE : a Thematic Network for Biosystems Engineering**

This new survey, at the European level, was carried out through the data analysis of the “University-Enterprise Cooperation” questionnaire, which was developed and distributed to all the partners of the EU funded ERABEE-TN (Education and Research in Biosystems or Agricultural and Biological Engineering in Europe - A Thematic Network).

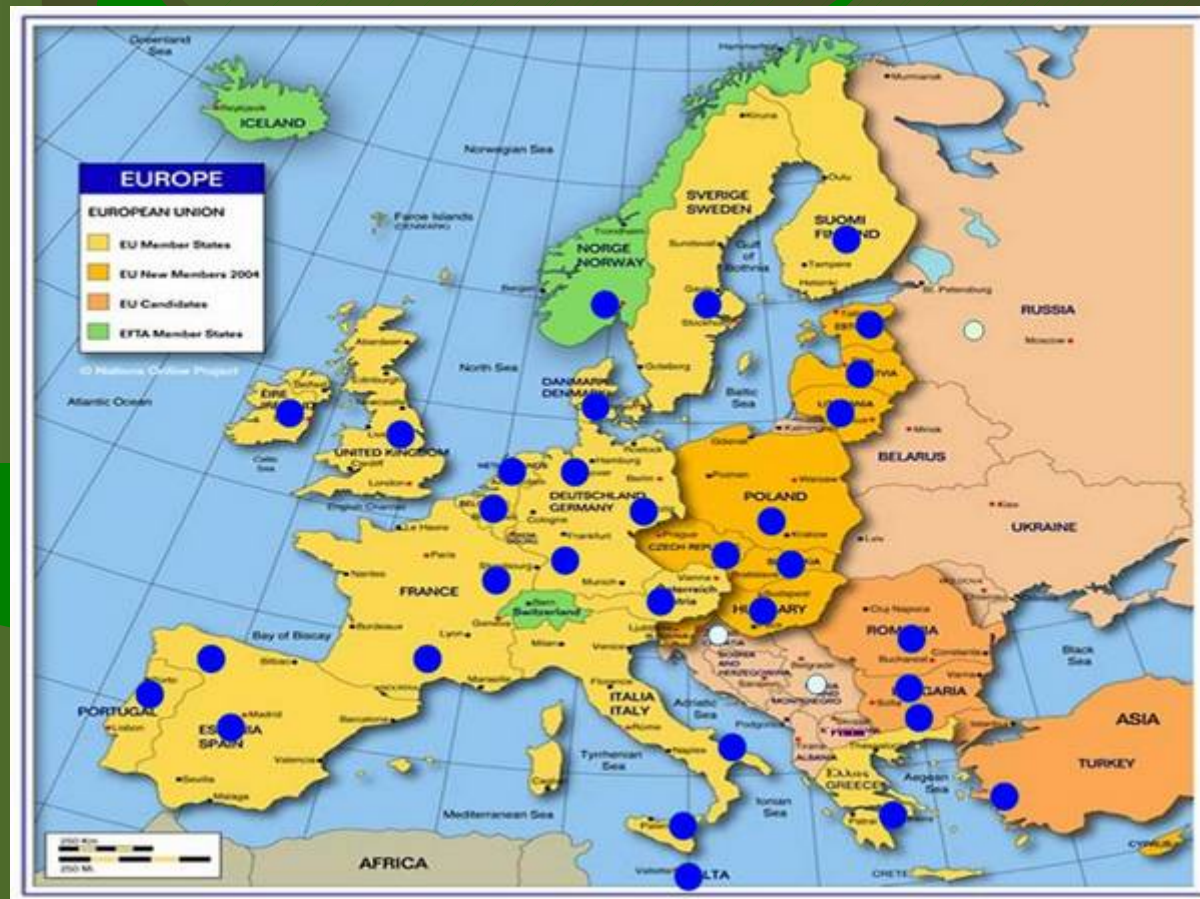
Biosystems Engineering is a field of engineering which integrates engineering science and design with applied biological, environmental and agricultural sciences.

It represents an evolution of the Agricultural Engineering discipline applied to all living organisms not including biomedical applications.

Therefore, Biosystems Engineering is “the branch of engineering that applies engineering sciences to solve problems involving biological systems”.

# Education and Research in Biosystems or Agricultural and Biological Engineering in Europe

The ERABEE-TN is constituted by 35 partners from 27 European countries : 33 Higher Education Area institutions and 2 student associations.







## **The innovative and novel goal of ERABEE-TN**

The goal of ERABEE-TN is to promote the transition from the traditional discipline of Agricultural Engineering to the emerging discipline of Biosystems Engineering, to enhance the compatibility among the new study programs in Biosystems Engineering, to aid their recognition and accreditation, at European and International level, and to facilitate a greater mobility of skilled personnel, researchers and students.

This transition will positively affect study programs, student learning outcomes and competences, in order to provide the industries with the desired graduates, having high level knowledge about specific subjects in Biosystems Engineering.

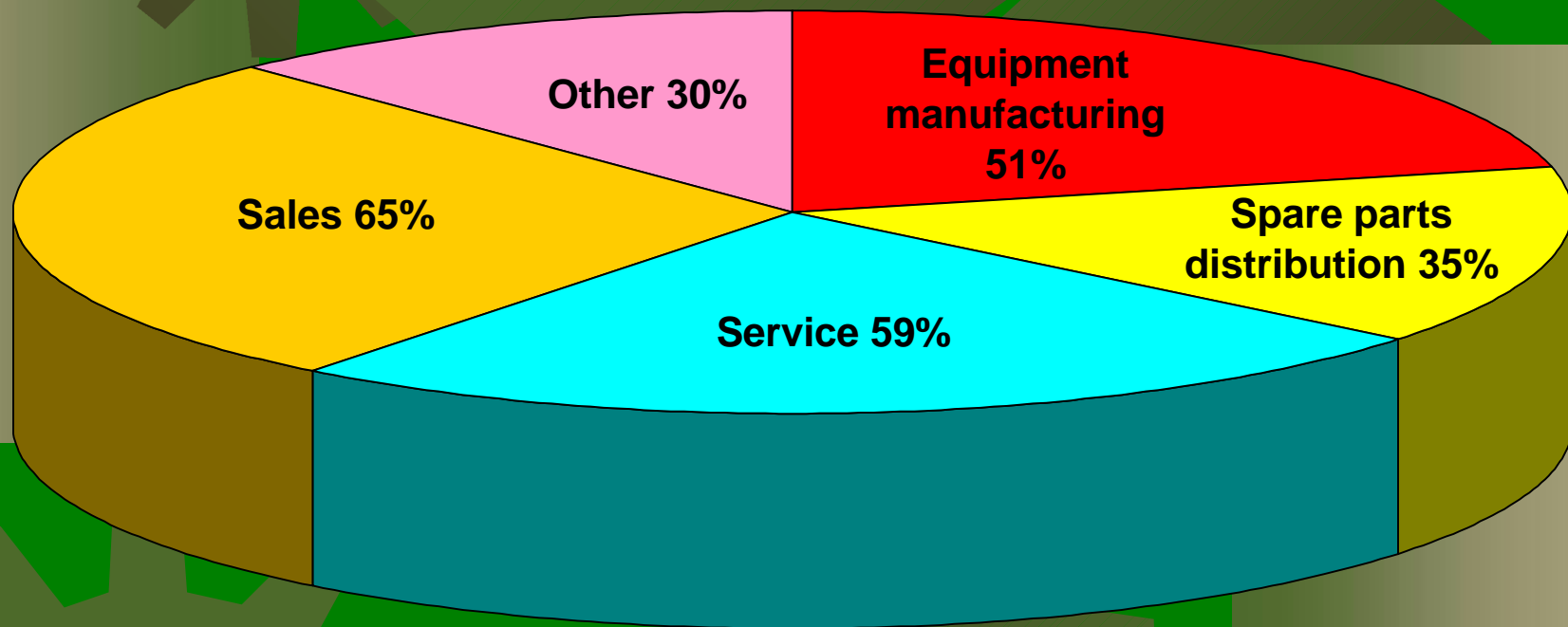
## The new survey : ERABEE questionnaire

37 industries involved in the area of Agricultural and Biosystems Engineering (i.e. industries of machines, equipment and materials for agriculture, food processing industries, companies of renewable energy systems and services for agriculture and environment) from 13 European countries replied to this questionnaire.

## List of “co-operating” EU industries

Country	Number	Industries
Bulgaria	3	Astra-Bioplant, Biosystems, Ludogorie 91
Czech Republic	4	Klimatik, Laski, Strom Export, Vari
Estonia	1	Termox
France	2	S@t-INFO, Sulky-Burel
Greece	2	Demeter, Geothermiki
Italy	6	Carlo Pellegrino, Calatrasi, Delta Serre, De Masi Costruzioni, PATI, Sicil Zappa
Latvia	3	Amazona, Jaunpagasts plus, Peruza
Lithuania	1	Kesko Agro
Netherlands	5	Agri Information Partners, Stork Food Systems, Kverneland Nieu Venne, Priva, Vencomatic
Norway	1	Kverneland Group
Portugal	1	Fundação Eugénio de Almeida
Romania	3	Briaris, Tehnofavorit, Valtec Tractoare Transilvania
Spain	5	ABASOLnorte, Coterram, TRAGSA, Española de Fomento del Lúpulo, Law Iberica

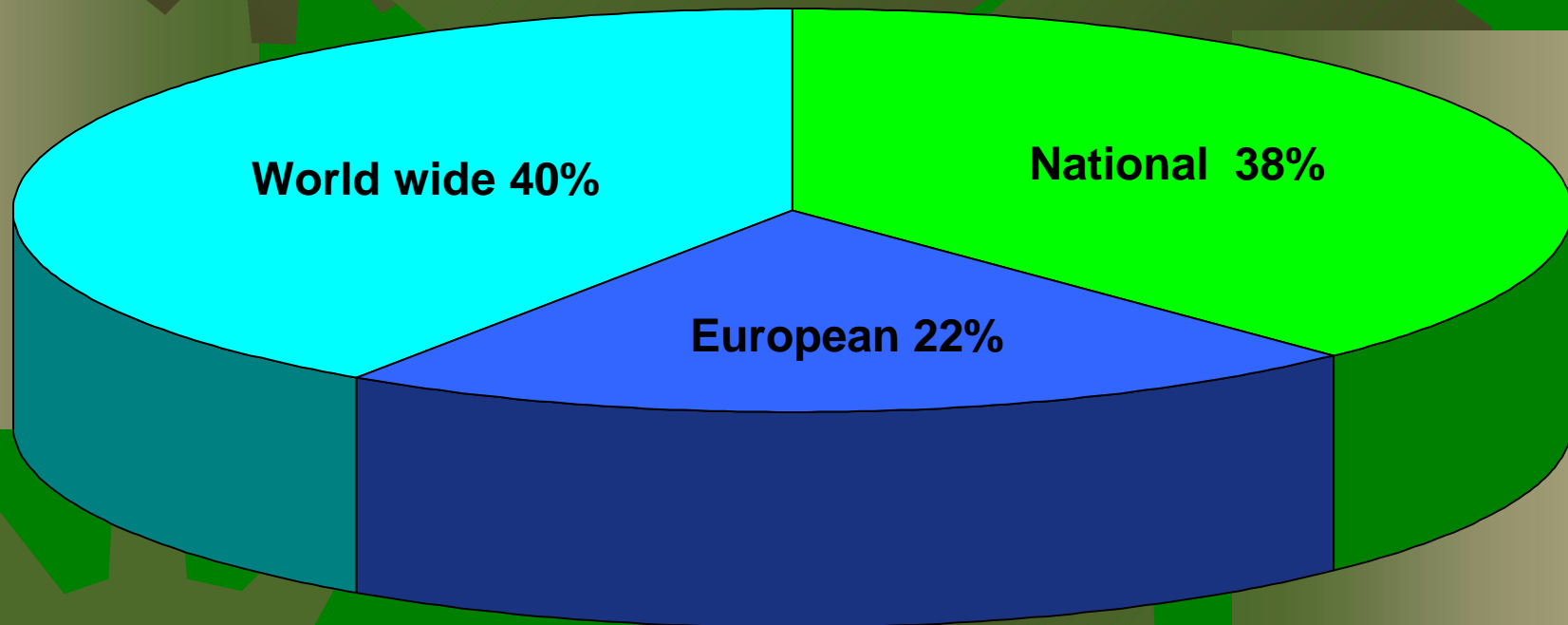
## Activity of the enterprise / company



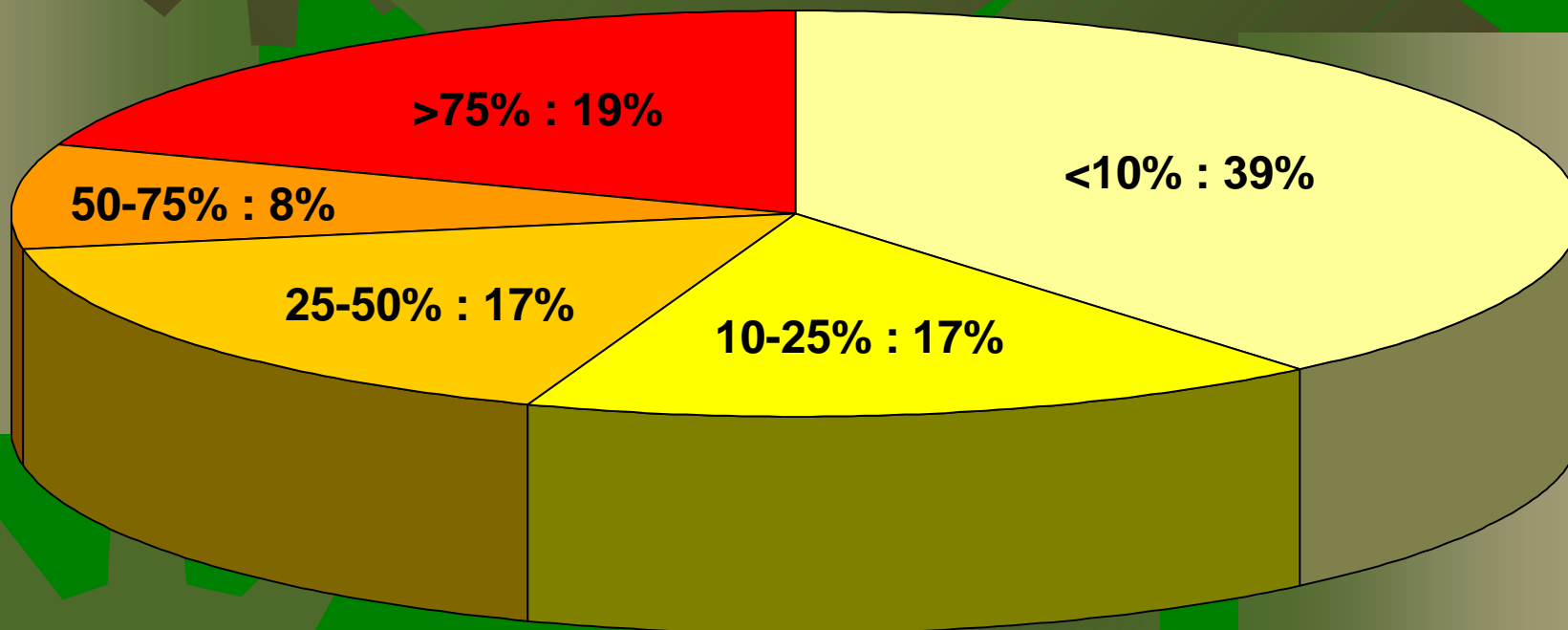
More than one reply was possible.



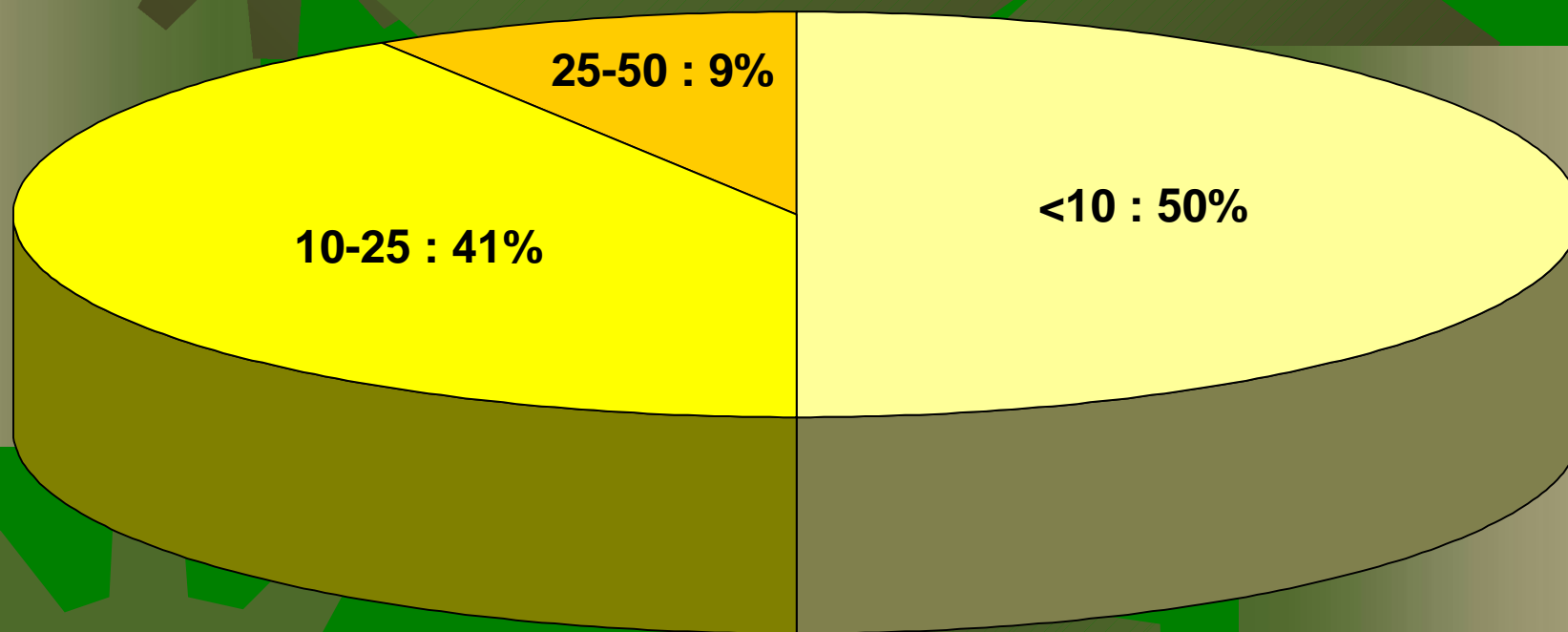
## **Geographic presence of the enterprise / company**



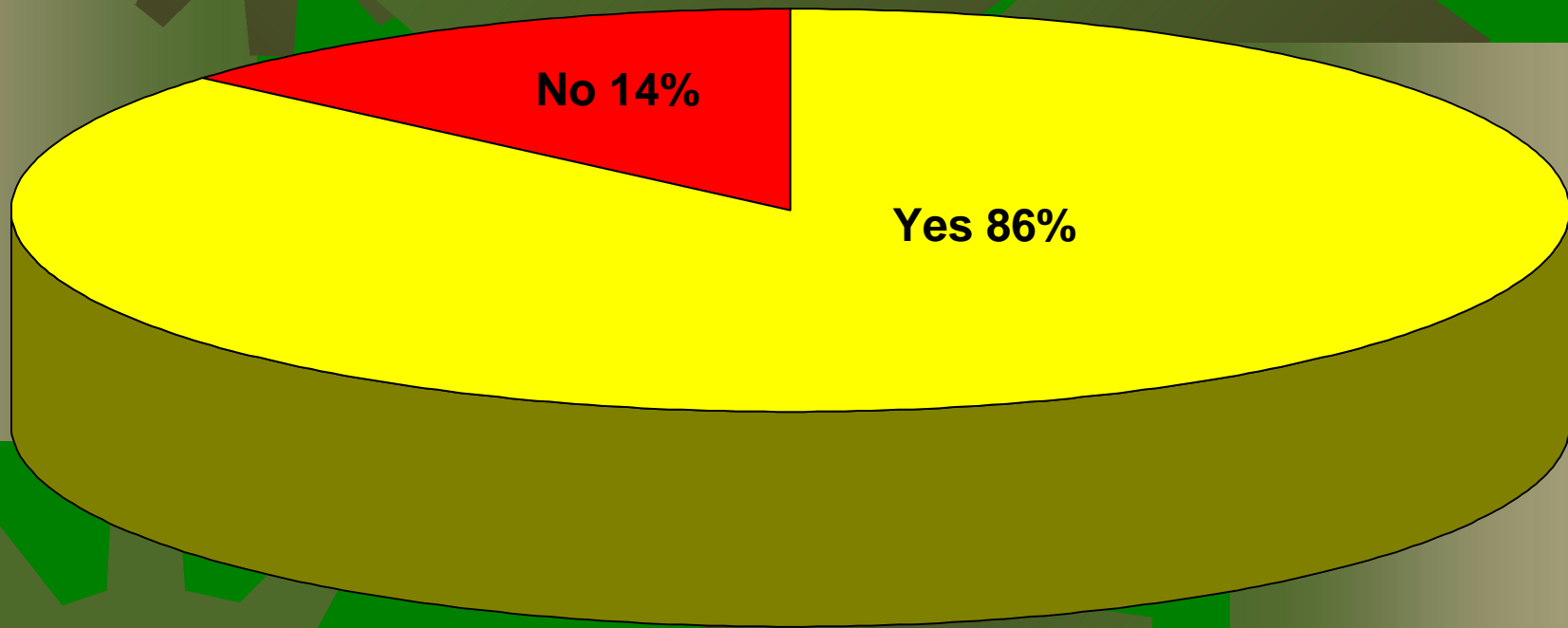
## Percentage of products exported



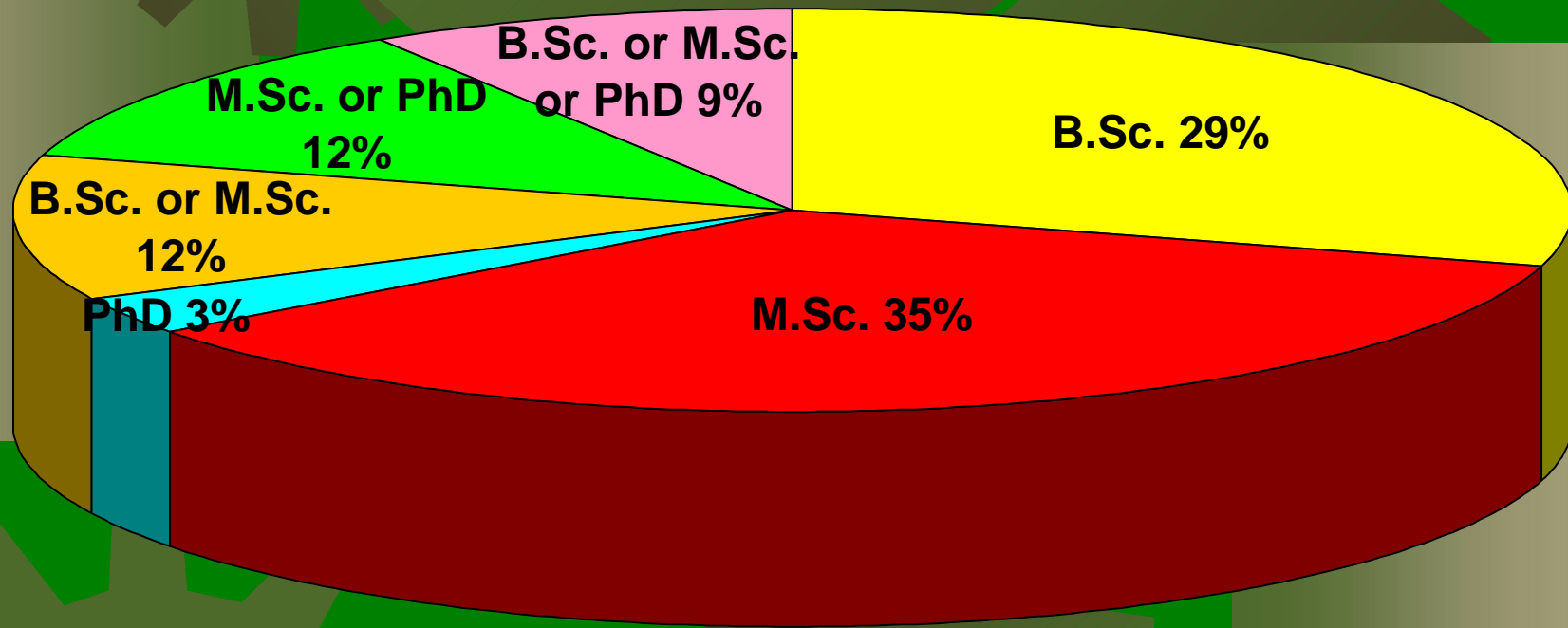
## Percentage of turnover invested back to R&D



**Are there career options in your enterprise / company  
relevant to Biosystems Engineering ?**

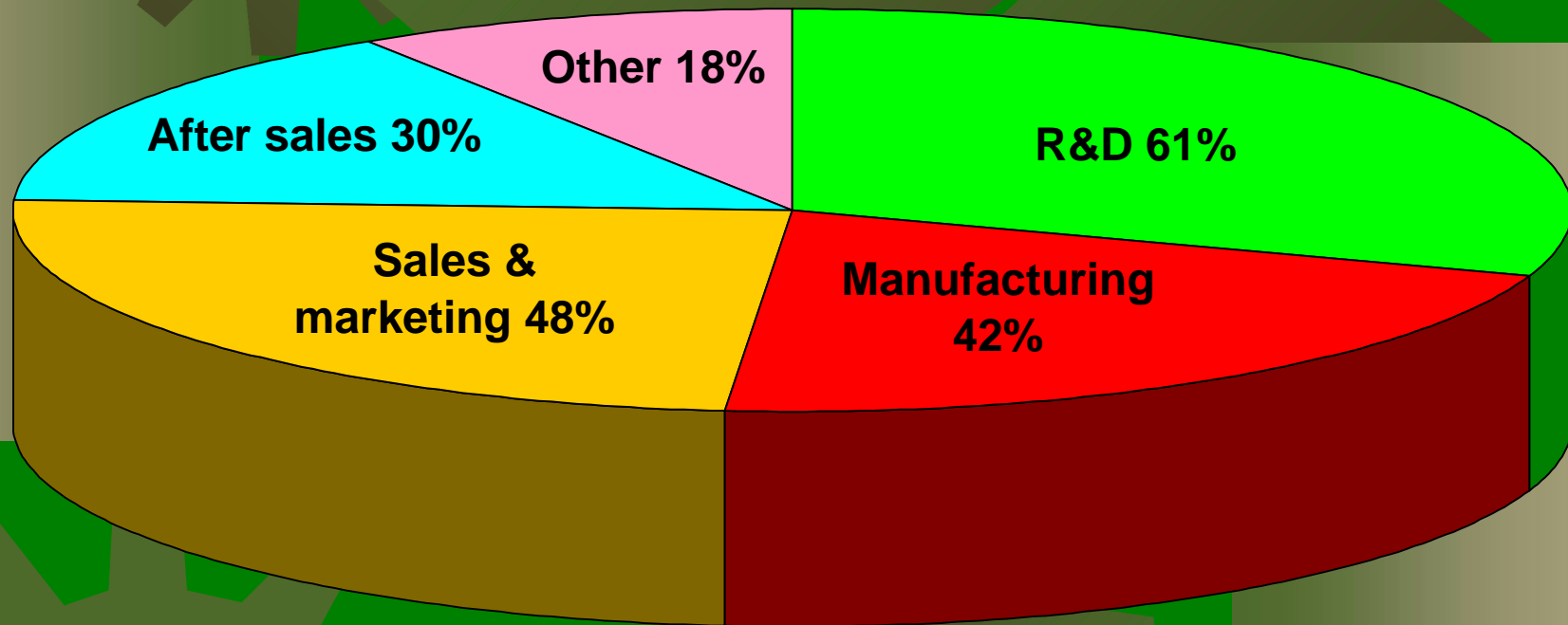


**Which degrees were preferred (B.Sc., M.Sc., Ph.D.) ?**



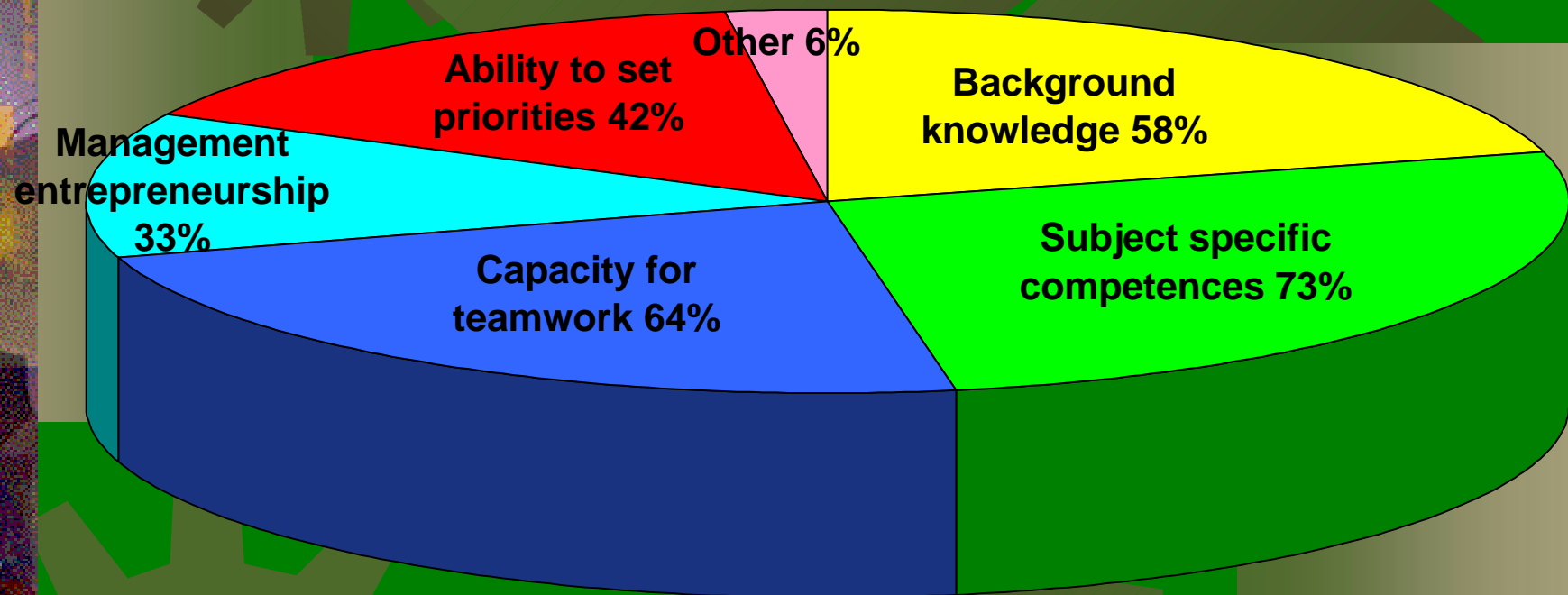


## In which Department of the enterprise do the graduates work ?



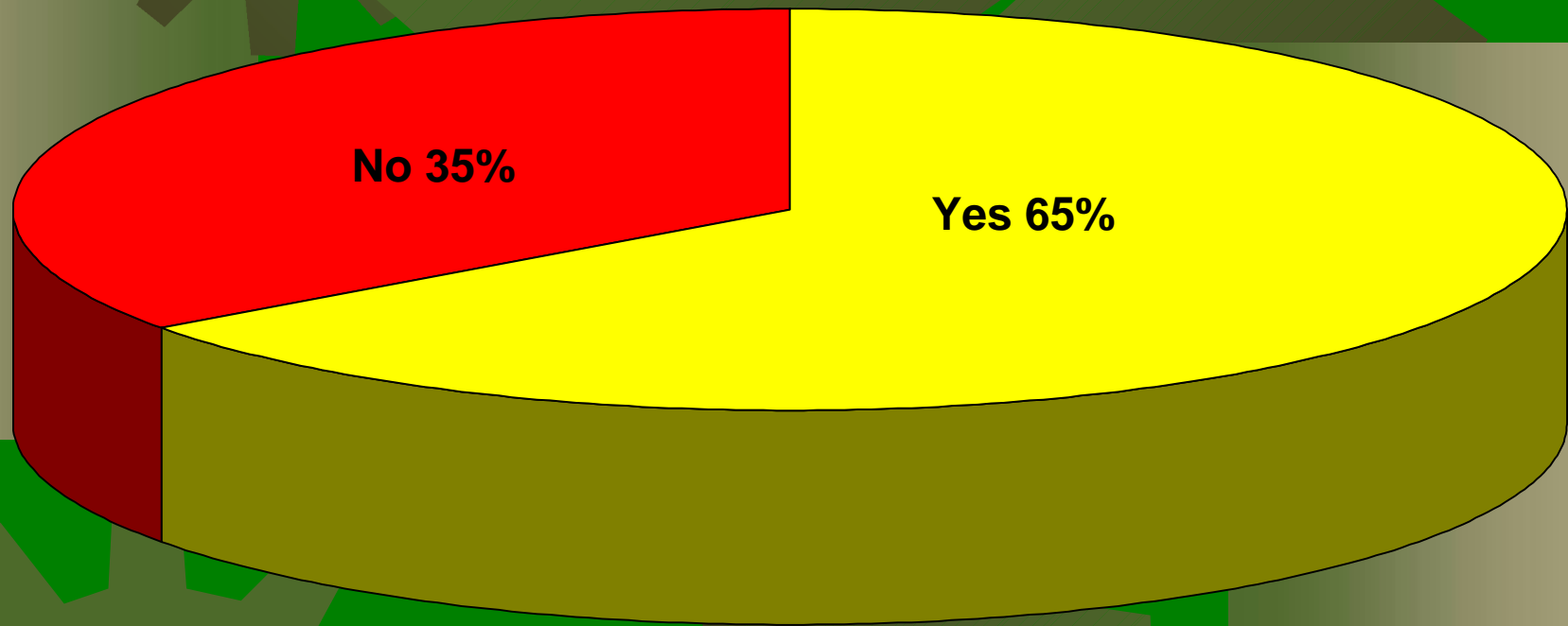
More than one reply was possible.

**Which are the directions in which you would like  
the programs of studies to place emphasis ?**

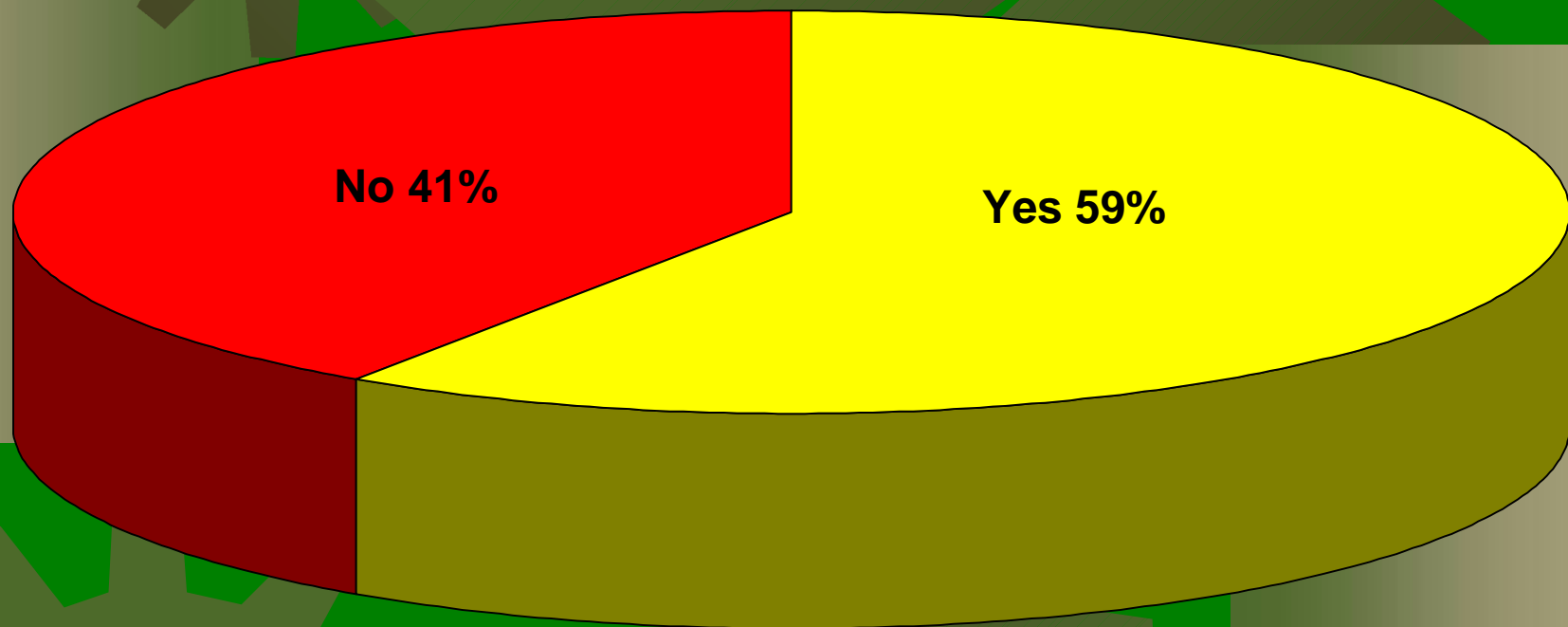


**More than one reply was possible.**

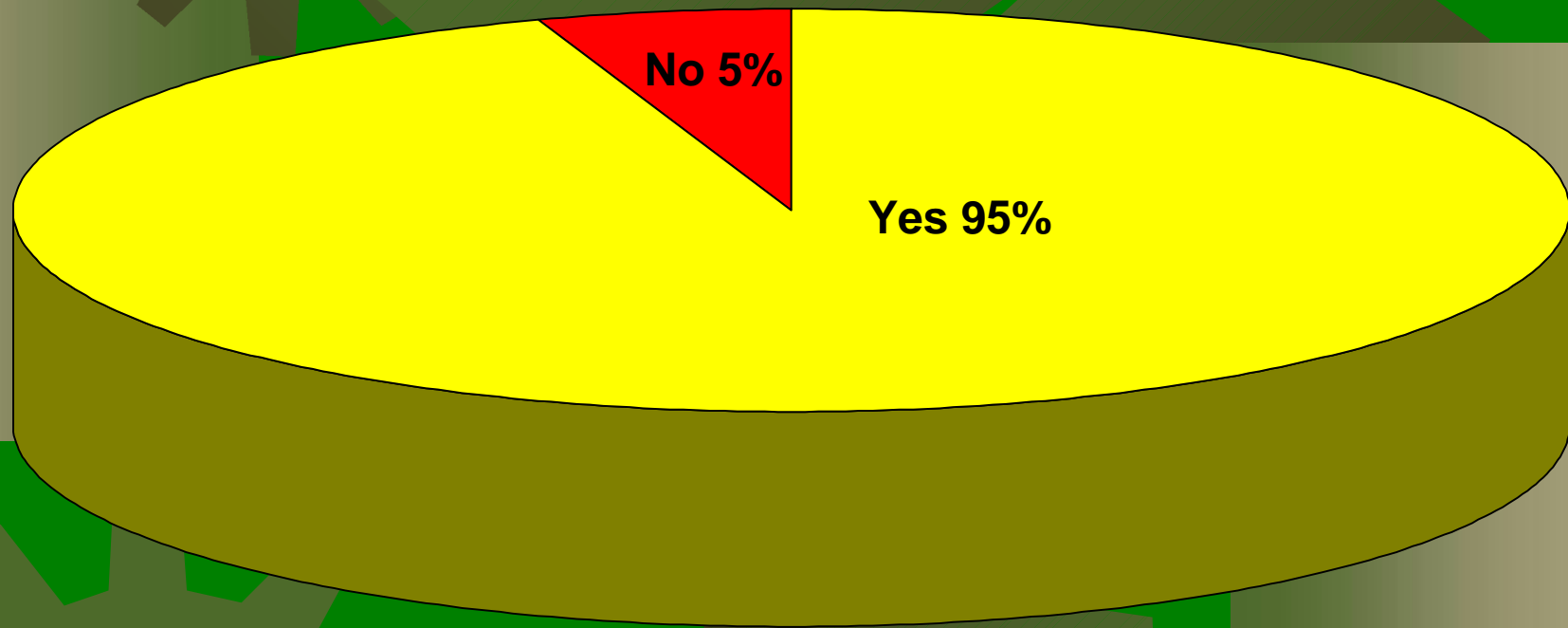
**Does your enterprise / company have a defined and comprehensive policy regarding University - Enterprise cooperation ?**



**Has your enterprise / company ever run a funded cooperation project with a University / institution / research group ?**

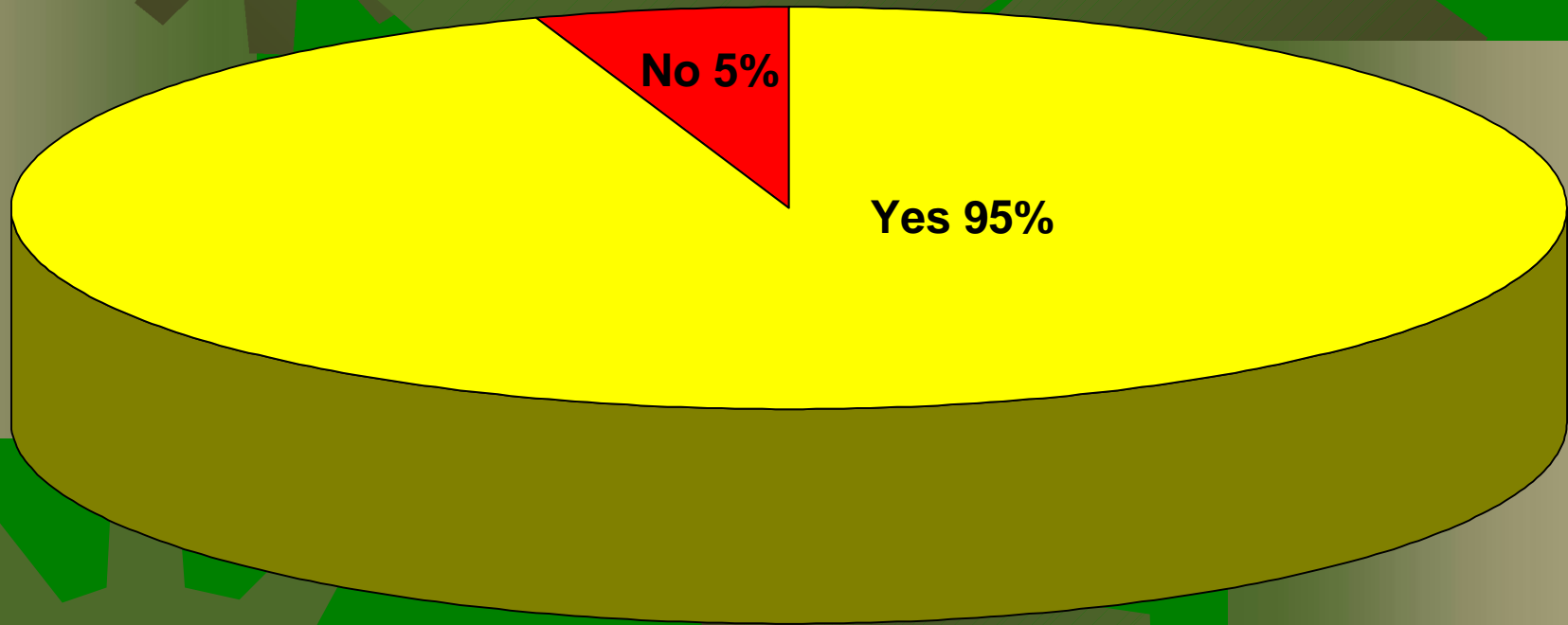


**Was the funded cooperation project successful ?**

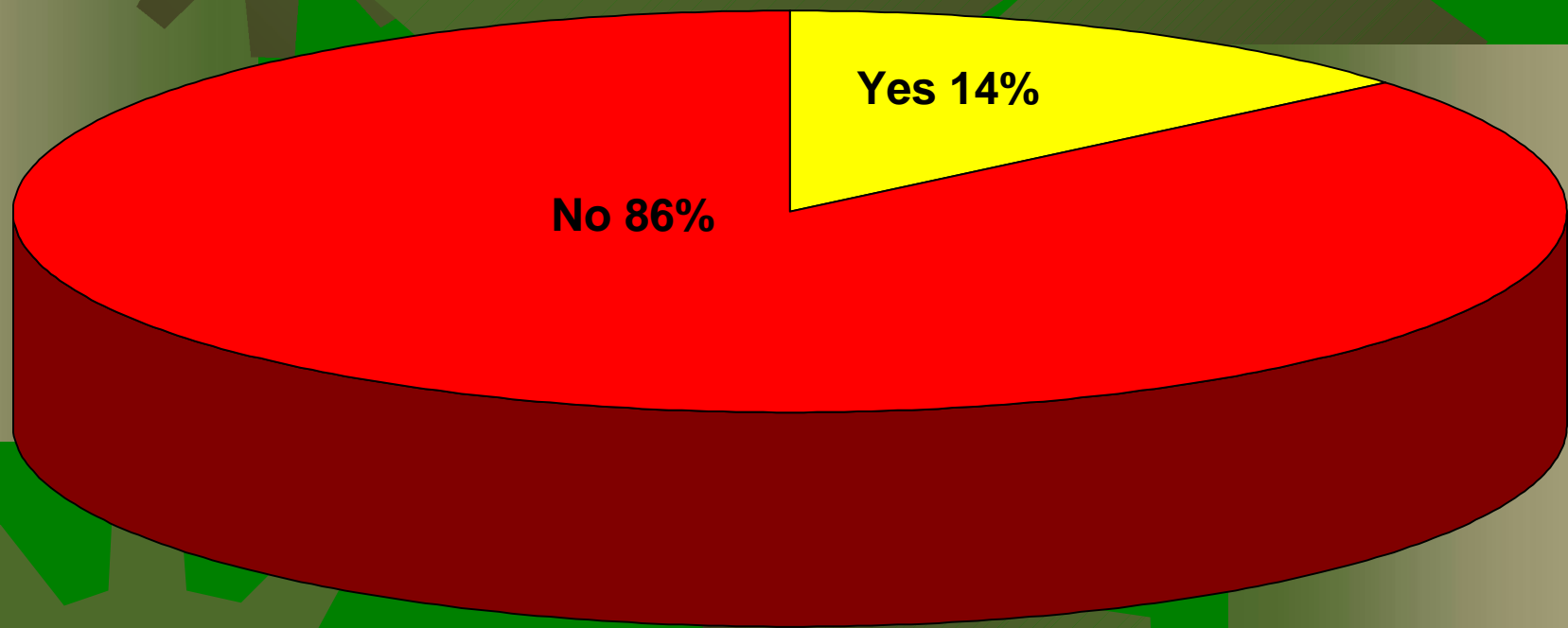




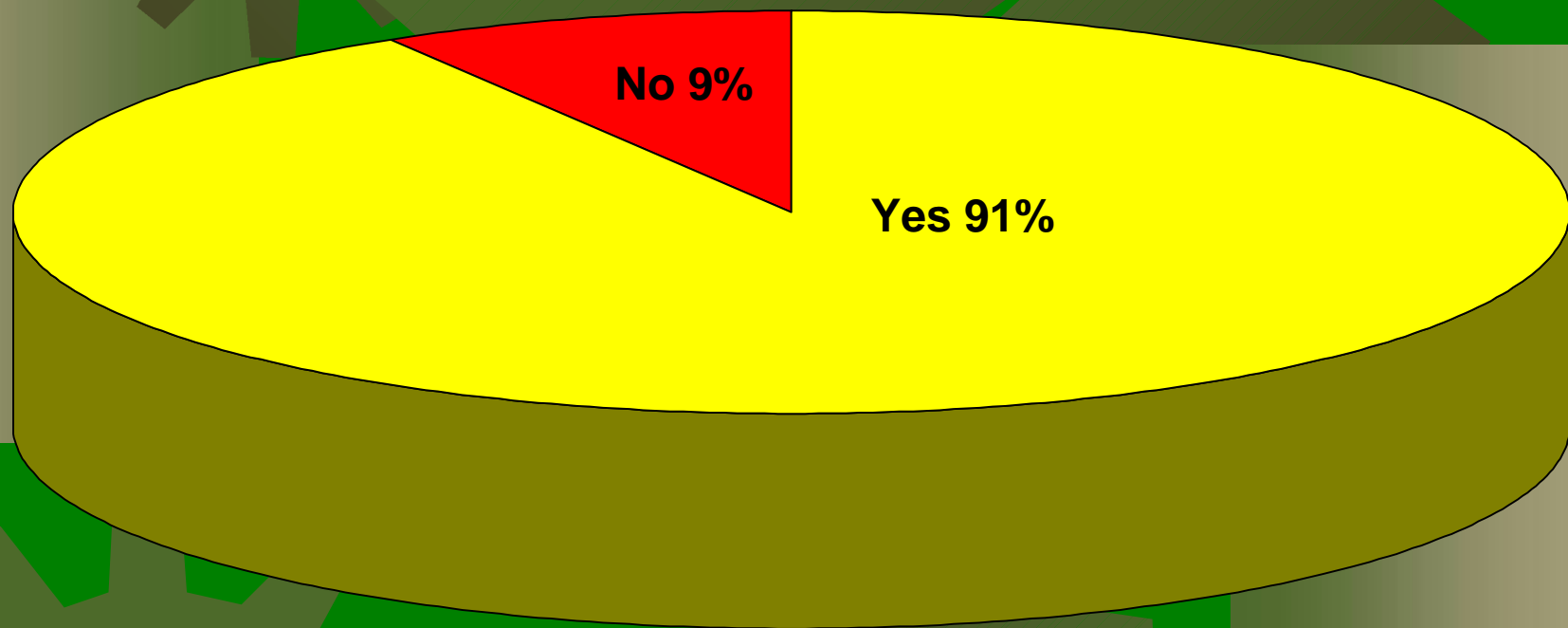
**Should industry and job market be more involved in the curriculum developments / restructuring of studies ?**



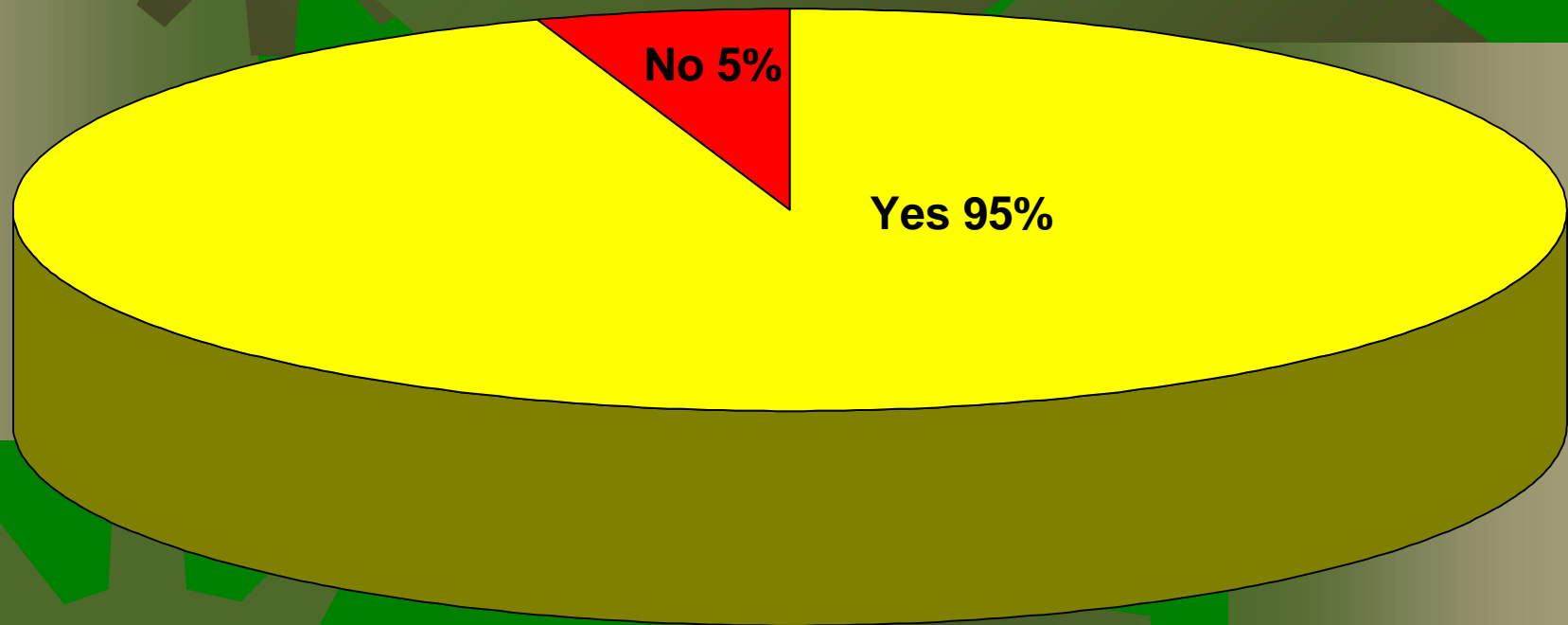
**Might this involvement have negative consequences ?**



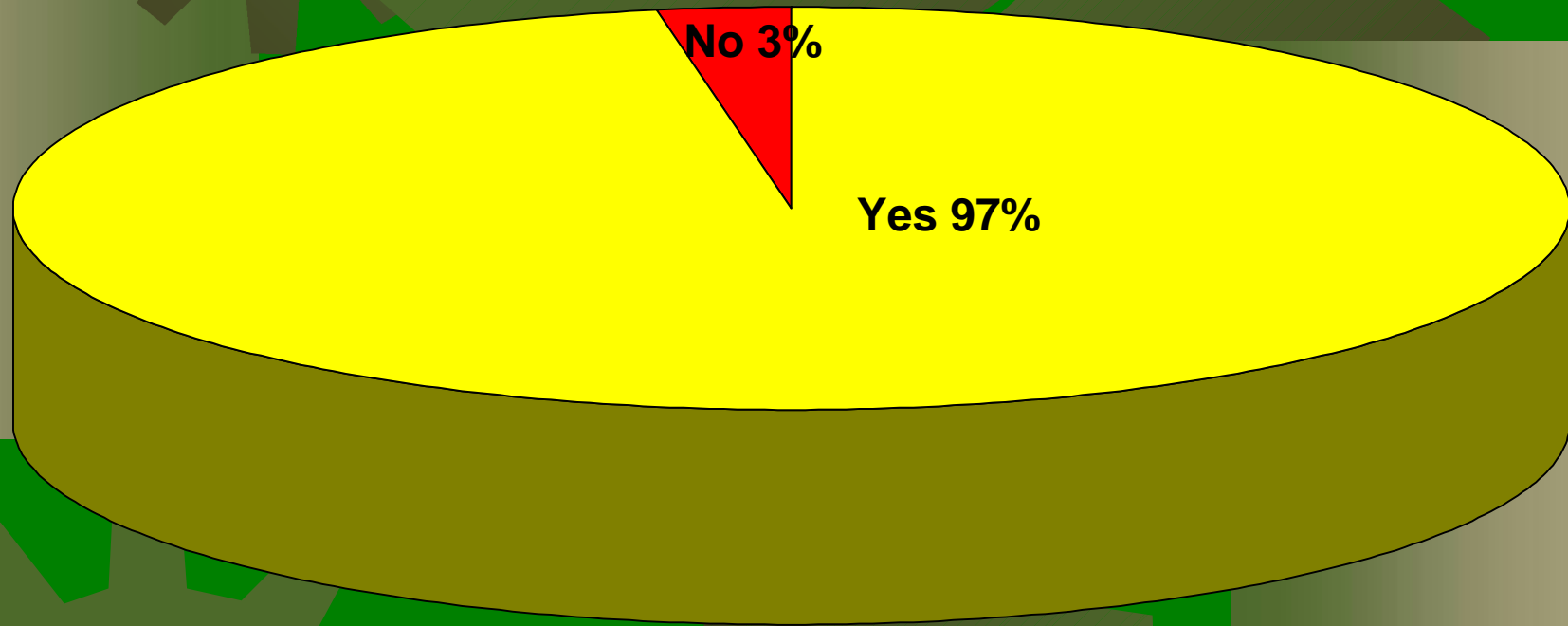
**Should entrepreneurial spirit be improved at University ?**



**Should continuing education programs be developed  
in cooperation with industry so as to meet the market needs ?**

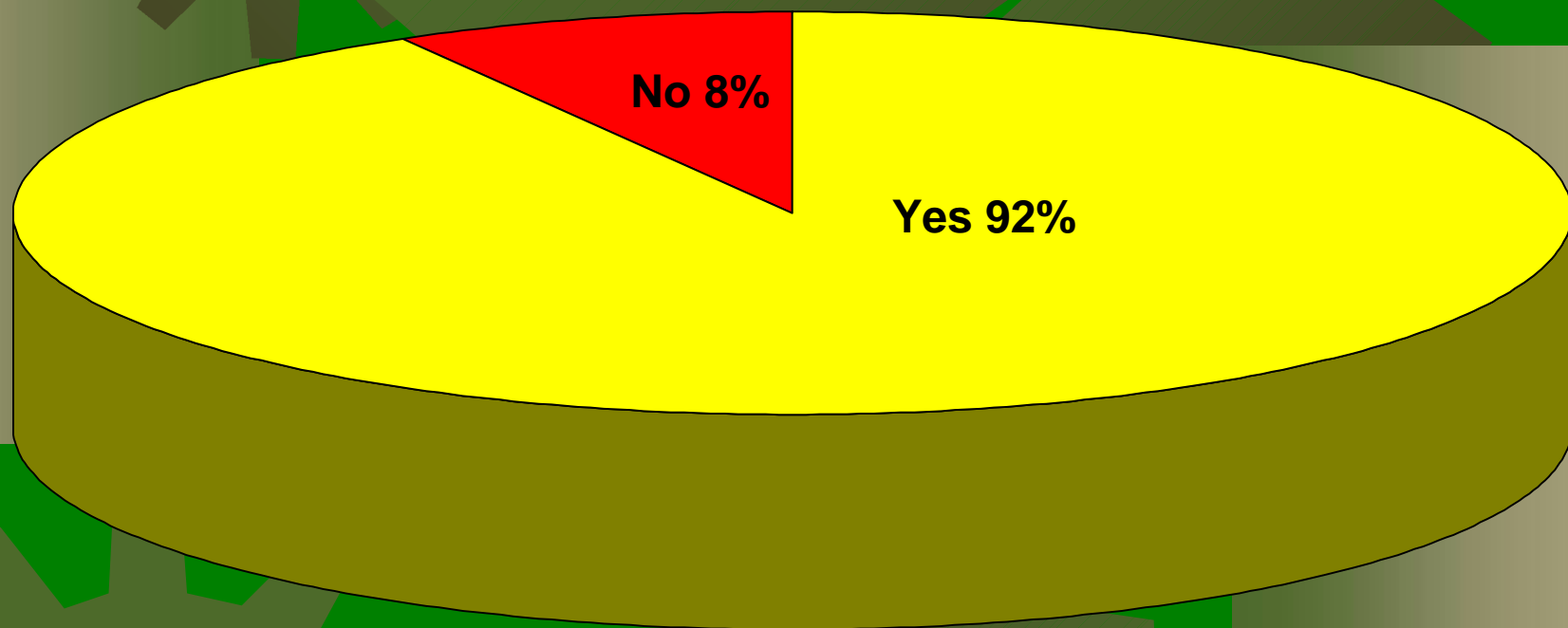


**Should the transfer of knowledge be facilitated and accelerated from University to industry and vice versa ?**

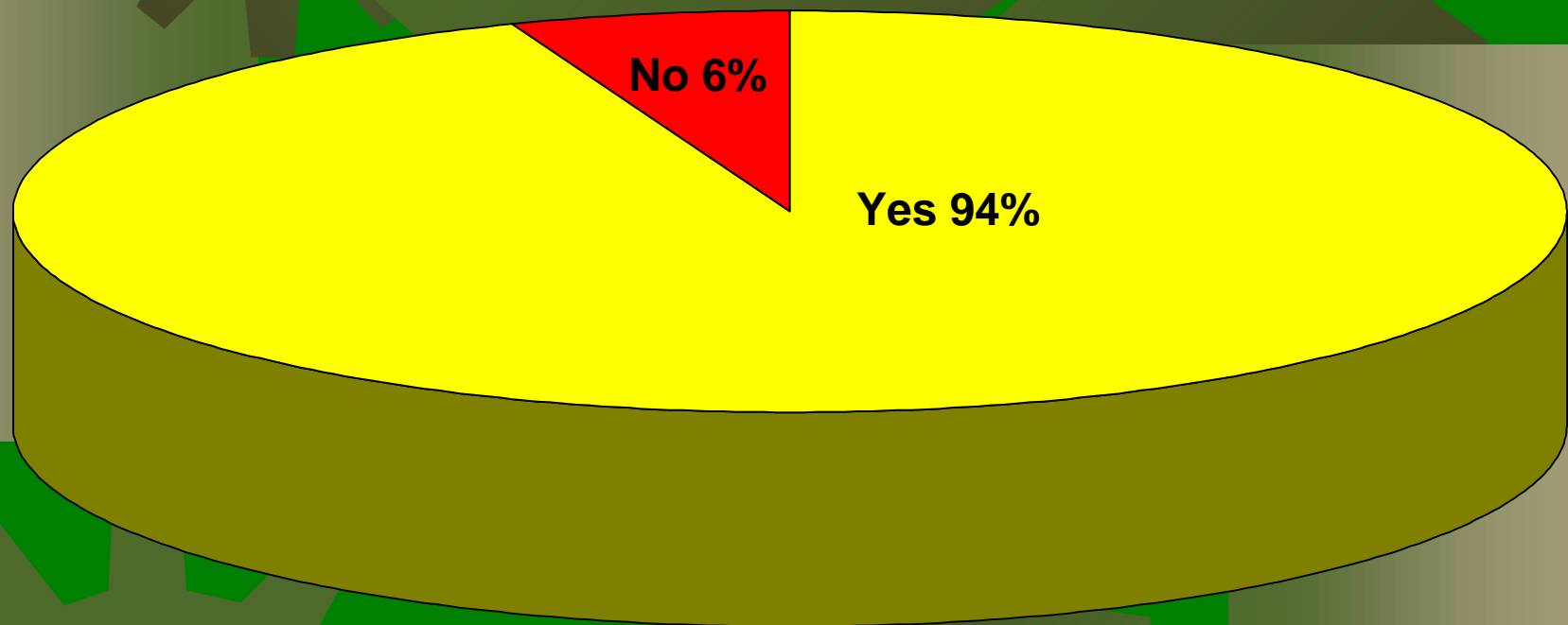




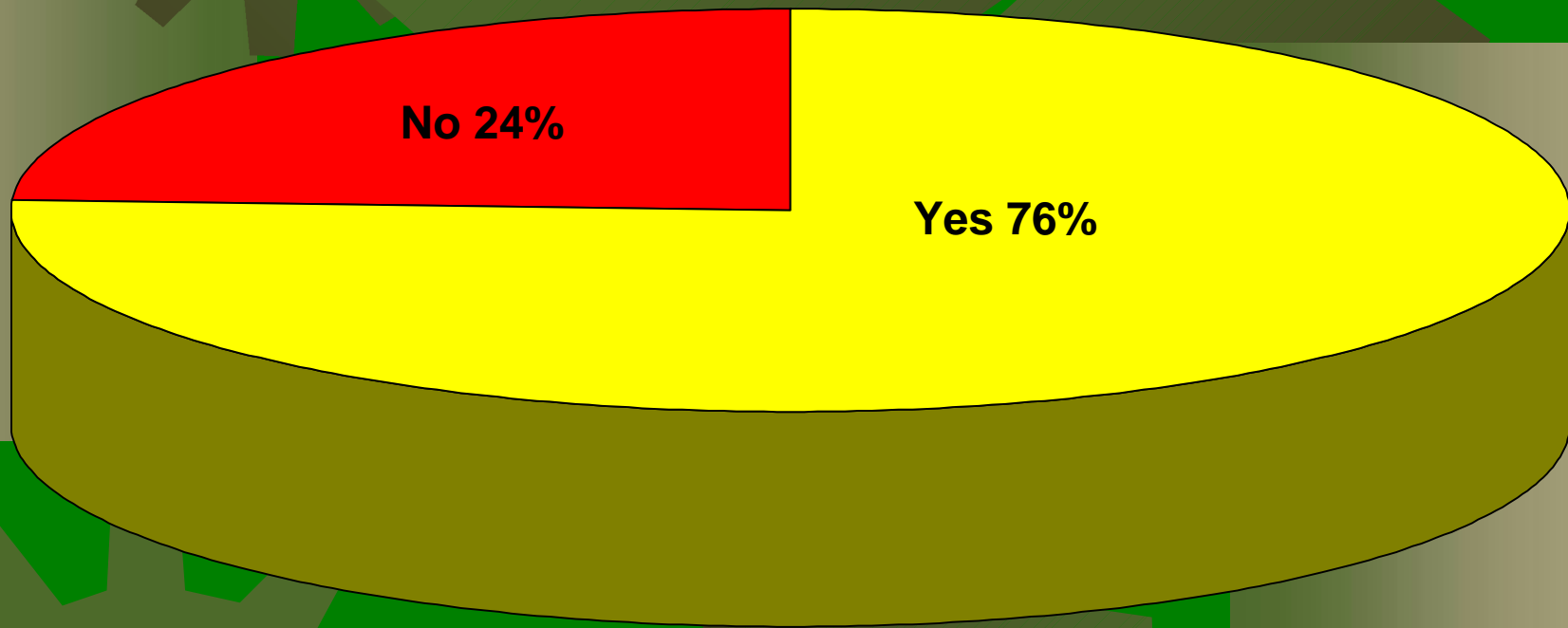
**Should permanent routes of dialogue be implemented  
between Universities and enterprises ?**



**Should joint education and/or training projects be developed ?**



**Should transnational programmes of student mobility  
be developed with the support of industry ?**





## **Free comments and suggestions by enterprises : Italy**

In order to reduce the transition period, during which the new graduates show lack of competences and abilities, practical training at industries is needed, not only for training them but also for getting the industries themselves to know their knowledge, competences and abilities and, therefore, for facilitating their employment (De Masi Costruzioni, Italy).

The degree study programs should include occasions for contact among students and enterprises, by means of technical visits and/or stages of practical training at the industries, and lessons held by enterprise staff at the Universities (PATI, Italy).

The development of long cycle (5-year) degree study programs is needed, because the graduates of short cycle (3-year) degree study programs showed missing professional abilities for carrying out the requested job at the industry (Sicil Zappa, Italy).



## Free comments and suggestions by enterprises : Spain

Universities prepare students only to be public officers but they provide neither staff for private enterprises nor for entrepreneurs (Coterram, Spain).

This questionnaire should not be a burden for companies for the spent time and cost.

There is neither enough time available nor enough financial resources for all the work that could be done in Agricultural Engineering sector.

It is needed to check the structure of SME (small and medium enterprises) and the resources invested in actual R&D, based on their own designs (Law Iberica, Spain).



## Discussion of results - 1/3

### Based on the replies to the questions :

- *“Are there career options in your enterprise / company relevant to Biosystems Engineering?”* and
- *“Which degrees were preferred (B.Sc., M.Sc., Ph.D.)?”*,

An optimal cooperation can be foreseen between Universities and enterprises specialised in Biosystems Engineering.

In fact, the majority of the enterprises (60%) is available to employ highly specialised graduates (M.Sc.) and/or post-graduates (PhD).

## Discussion of results - 2/3

**Based on the replies to the question :**

- *“Should industry and job market be more involved in the curriculum developments / restructuring of studies?”*,

Almost all the enterprises aim at a higher involvement in the development and/or restructuring of degree study programs.

**In fact, based on the replies to the question :**

- *“Should entrepreneurial spirit be improved at University?”*,

They believe that the entrepreneurial spirit must be developed within the University.

## Discussion of results - 3/3

**This is confirmed by the replies to the questions :**

- *“Should the transfer of knowledge be facilitated and accelerated from University to industry and vice versa?” and*
- *“Should permanent routes of dialogue be implemented between Universities and enterprises?”*,

Demonstrating that the enterprises aim at an easier and faster transfer of knowledge and a permanent route of dialogue with the Universities.

## Conclusions - 1/2

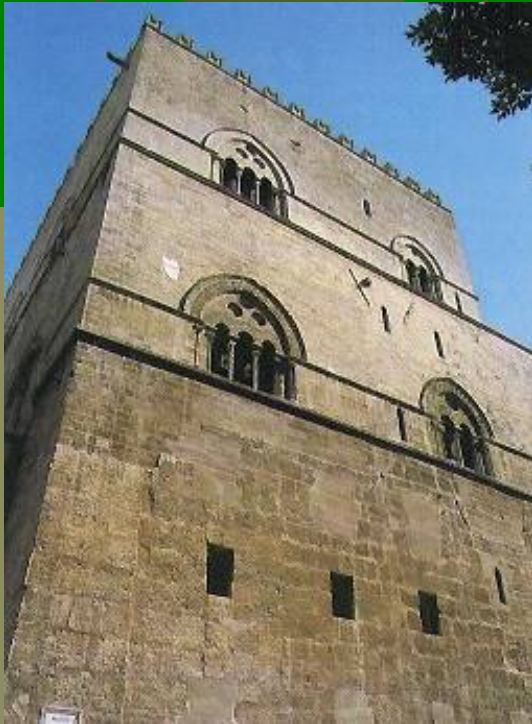
One way for satisfying the sensed demand for cooperation by the industries could be a network project, aimed at funding the exchange of human resources (*especially M.Sc. and PhD students, and enterprise staff*) between the Universities and the enterprises.

The encouraging results obtained suggest the need of addressing this survey to a higher number of industries, including the relevant ones from the missing EU countries (*UK, Germany, Poland, etc.*).

## Conclusions - 2/2

The results of this survey are to be widely disseminated to all the stakeholders involved in the area of Biosystems Engineering (*i.e. Universities, enterprises, research centres, national associations of agronomists and agricultural engineers, Ministries of Education, Agricultural Politics and Industry*), in order to facilitate, at the European level, the transition from the traditional Agricultural Engineering discipline to the emerging Biosystems Engineering one and its better exploitation by all parties involved, including graduates and enterprises.

# Thank you for your attention !



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