Crops2Industry

“Non-food Crops-to-Industry schemes in EU27”

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CRES - Center for Renewable Energy Sources

3rd Thematic Workshop, Bordeaux/France, 18 February 2011

background

- The Centre for Renewable Energy Sources and Saving (CRES) is the Greek national centre for Renewable Energy Sources (RES), Rational Use of Energy (RUE) and Energy Saving (ES)
- CRES was founded in September 1987, it is supervised by the Ministry of Development, General Secretariat of Research and Technology, and has financial and administrative independence.
- Its main goal is the promotion of RES/RUE/ES applications at a national and international level, as well as the support of related activities taking into consideration the environmental impacts, in the energy supply and use.

Identity of CRES: Two directions

National Energy Centre

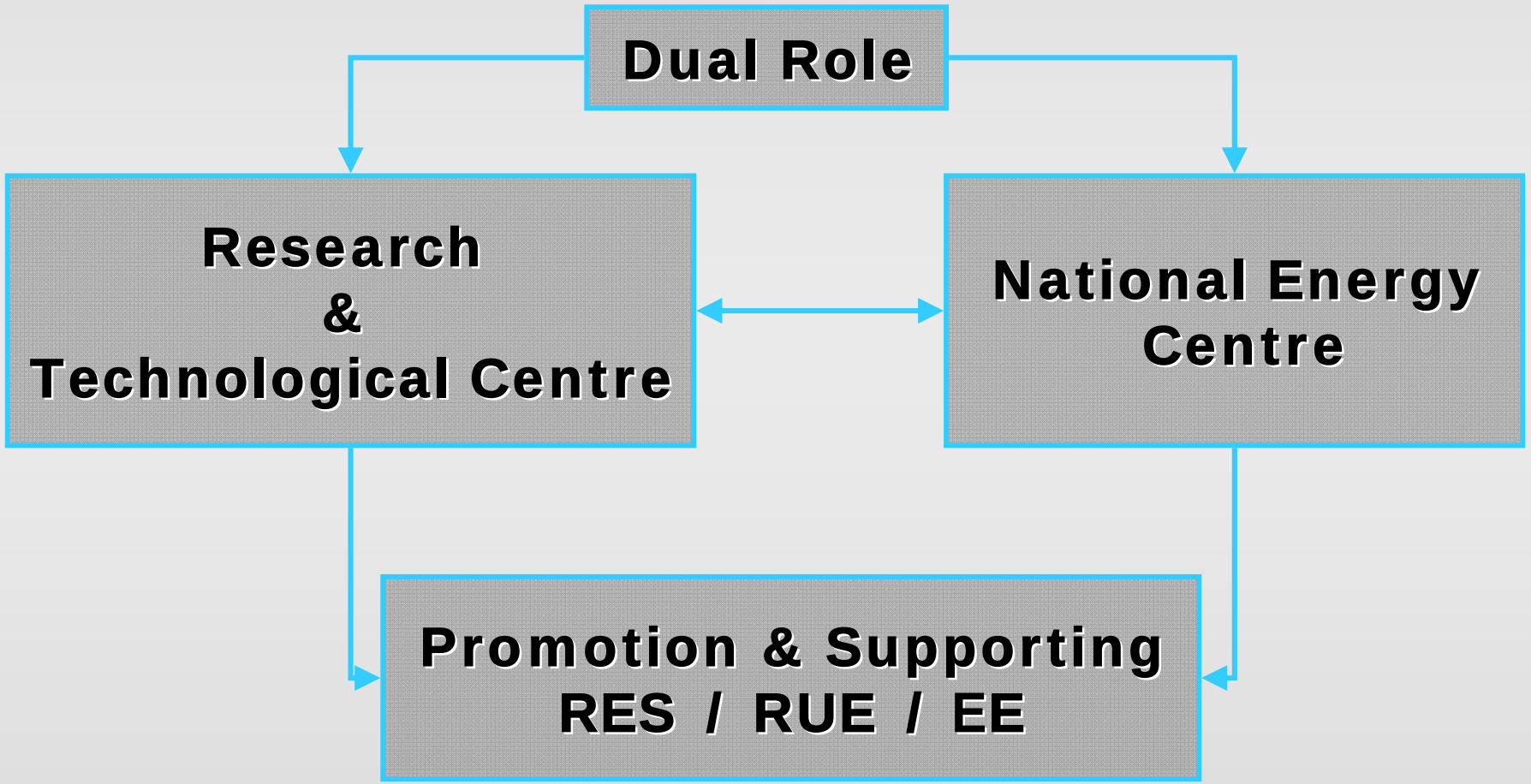
In support of :

- **Policies Formulation**
- **Investment programmes management**
- **Energy planning**
- **Dissemination**

Energy Research Centre

Research and Applications regarding :

- **New and Renewable Energy Technologies**
- **Energy Efficiency Technologies**


Dual Role
Research
&
Technological Centre
National Energy
Centre
Promotion & Supporting
RES / RUE / EE

sectors

- WIND ENERGY
- BIOMASS
- GEOTHERMAL ENERGY
- SOLAR ENERGY
- PV SYSTEMS
- SMALL HYDRO & OCEAN ENERGY
- RES & HYDROGEN TECHNOLOGIES
- RATIONAL USE OF ENERGY & ENERGY EFFICIENCY
- ANALYSIS OF ENERGY POLICY & SYSTEMS
- BUILDING CELL & INDOOR CLIMATE
- SUSTAINABLE TRANSPORT & ENVIRONMENT

participation in more than 600 European and national projects.

These include R&D projects, demonstration & pilot projects, development of energy information systems and energy modelling, energy policy studies, investment feasibility studies, techno-economic studies, market research, environmental impact assessments as well as training and promotional activities on the RES/RUE/ES related issues.

CRES has also provided important services to **third parties** (private investors, companies) and to local authorities, concerning the exploitation of the technical and techno-economic possibilities for the application of RES/ RUE/ES.

Personnel & Networks

scientific staff of more than 110 highly qualified engineers and other scientists (the total personnel numbers 165 people)

CRES co-operates with other institutes, organisations, universities, consultants, international organisations (such as the IEA, UNESCO, ISES, PLEA, IEC, CEN, etc)

it is an active member of various European and international networks, such as the E^{n}R, MEDENER, EUFORES, EWEA, DYNASTEE, MEASNET, EUREC Agency, etc.

The overall objective *is* to **explore the potential of non-food crops**, which can be domestically grown in EU27 context, **for selected industrial applications**, namely oils, fibers, resins, pharmaceuticals and other specialty products **and outline and prioritise crops-to-products schemes**, suitable for the different Member States, which will support sustainable, economic viable and competitive European bio-based industry and agriculture.

The expected output will be to identify whether and under which terms Europe has the potential and the technical competence to develop a competitive bio-industry fed by a sustainable agriculture.

The concept

Oil Crops

Fibre Crops

Carbohydrate Crops

Other Specialty Crops

Crop2Industry

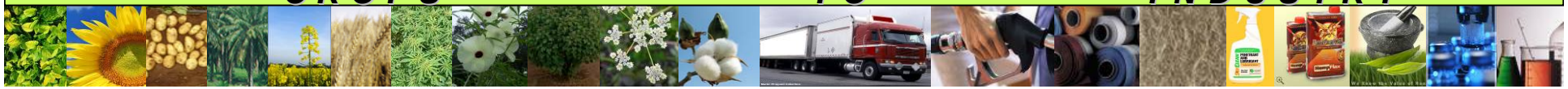
Oils

Fibres

Resins

Pharmaceuticals and other specialty products

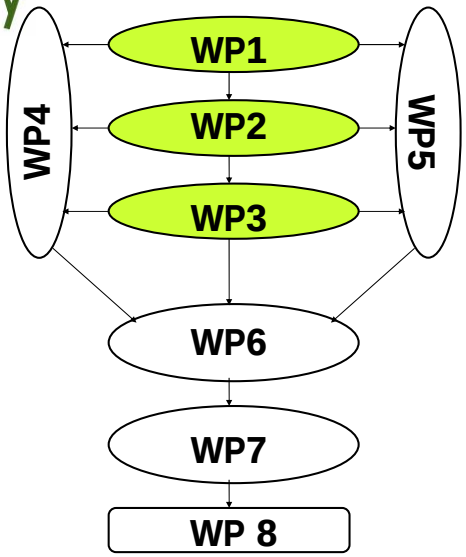
CROPS TO INDUSTRY



The consortium

CRES - Centre for Renewable Energy Sources, Greece	**Crops**
UNIBO - University of Bologna, Italy	
INF&MP - Institute of Natural Fibres and Medicinal Plants, Poland	
BIOS – BIOS AGROSYSTEMS S.A., Greece	
NCPRI – National Institute for Chemical and Pharmaceutical Research and Development, Romania	
ITERG, France	**Industry**
KEFI – Kenaf Eco Fibers Italia S.p.A, Italy	
Hempflax B.V, The Netherlands	
CHIMAR Hellas S.A, Greece	
AUA - Agriculture University of Athens, Greece	**Biotechnology**
ICCEPT – Imperial College London, UK	**Economics**
OeKO – Institut of Applied Ecology, Germany	**Sustainability**
BOKU – University of Natural Resources and Applied Life Sciences, Austria	
FZ-JUELICH Forschngszentrum Julich GmbH, Germany	**Overall assessment**

Project activities

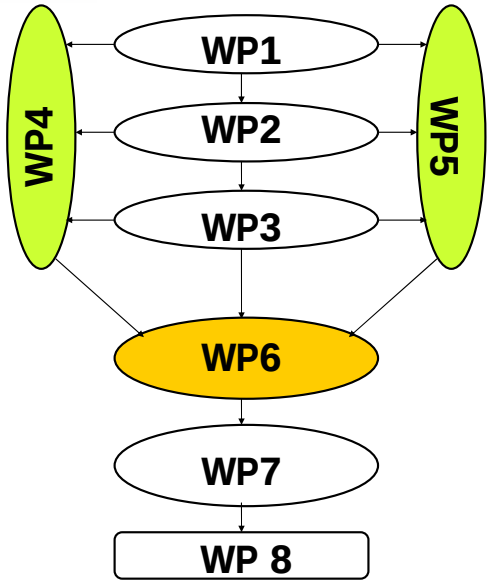


- Identify current molecular genetics technologies (genomic and biotechnological tools) and suggest their potential applications in a crop-specific manner to address a wide range of breeding constraints regarding yields and tolerance to abiotic and biotic conditions (WP2/AUA)

- Explore the potential of non-food crops, which can be domestically grown in EU27 countries, for selected industrial applications (WP1/CRES)

- Explore the potential and feasibility of the European industry to make high-value biobased products namely oils, fibers, resins, pharmaceuticals and other specialty products (WP3/INF&MP)

Project activities

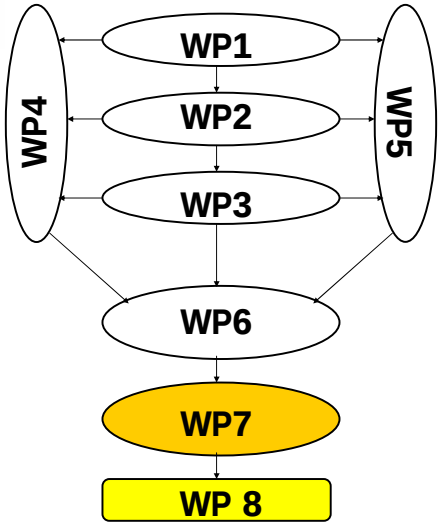


- Perform supply chain cost analysis, identify best business opportunities and assess the socio-economic impacts of selected crop-to-product schemes at EU-27, regional and country levels (WP4/IMPERIAL)

- Assess selected production and environmental impacts and identify a ‘core’ list of standards and criteria for the environmental and socio-economic sustainability of selected non-food crops-to-industrial-products systems(WP5/OECO)

- Perform an overall assessment aiming to select and prioritise crops-to-products schemes in technical, socio-economic and environmental terms (WP6/FZJ)

Project activities



Dissemination activities (WP7) –

- project website (www.crops2industry.eu)
- links with other activities, like:
  - Plants for the future platform
  - IENICA project
  - 4F Crops project

Thematic workshops

- Can fibre crops offer a viable alternative land use option? (Poland, 18/11/09)
- Carbohydrate crops and the dilemma of using them for non-food purposes (The Netherlands, 12/3/10)
- **Can oilseed crops offer a sustainable alternative for bio-based industrial products? (France, 18/2/11)**
- **Niche markets for specialty industrial crops (Greece, 2/9/11)**
- Non-food crops for a bio-based Industry and sustainable agriculture (Italy, 2/2012)

WP1. Non-food crops

Objective: Explore the potential of non-food crops, which can be domestically grown in EU27 countries, for selected industrial applications

Task 1.1 Oil crops

Task 1.2 Fibre crops

Task 1.3 Carbohydrate crops

Task 1.4 Other specialty crops

Task 1.5 Multiple end use potentials and allocation factors

Task 1.6 Assess available land area for non-food crops in EU27

Topic areas

- Plants anatomy
- Areas of origin and current cultivation
- Growing conditions – input requirements
- Logistics
- Yields
- Quality
- Applications: current – potential
- Factors restricting growth and yields
- Research gaps

WP3. Bio-based products

Objective: Explore the potential and feasibility of the European industry to make high-value biobased products namely oils, fibers, resins, pharmaceuticals and other specialty products

Task 3.1. Oils

Task 3.2. Fibres

Task 3.3 Resins

Task 3.4 Pharmaceutical and other specialty products

The **output** of this WP will be:

- Review on the product yielding capacity from various industrial crops streams
- Identify desirable quality characteristics for mature industrial processes
- Report on current alternative resources for each industrial use
- Set prospects to widen the range of potential feedstocks
- Identify restricting factors that inhibit broader industrial use of the biomass feedstocks
- Define research gaps, prospects and recommendations

8:30 – 9:10	***Registration***	
9:10 – 9:20	Welcome – Chimar Hellas SA activities Role of Chimar Hellas in Crops2industry	*Eleftheria Athanasiadou,* *Electra Papadopoulou, CHIMAR*
9:20 – 9:40	Welcome – BIOS activities	*Efthymis Ethymiadis, BIOS*
9:40 – 10:00	CROPS2INDUSTRY Project outline	*Myrsini Christou, CRES*
10:00 – 10:20	Other specialty crops in Greece	*Christos Dordas, Aristotle University of Thessaloniki*
10:20 – 10:40	***Coffee break***	
10:40 – 11:00	Herbal Research and Processing Romanian Company-Tradition, Opportunities, Challenges and Prospects	*Roxana Mihailescu, PLANTAVOREL*
11:00 -11:20	Vegetal Bioresources, from Ecological Cultures to Industrial Capitalization	*Elvira Gille, "Stejarul" Research Centre, DACIA PLANT*
11:20 -11:40	Organic herbs – Collaborations with Greek producers	*George Stavropoulos, KORRES*
11:40 – 12:00	Medicinal herbs and bee products in the development of natural cosmetics	*Anagnostis Tsoukalas, APIVITA*
12:00 – 12:20	Sustainable production of targeted green industrial products via novel consolidated biochemical processing of lignocellulosic materials	*Prof. Costas Kiparissides, Aristotle University of Thessaloniki*
12:20 – 13:30	***Lunch break***	
13:30 – 13:50	Glycerol as a co-product of oleochemicals /biodiesel and vegetable oil derivatives from Castor oil for the production of fine chemicals in perfume and pharmaceuticals	*Jean Luc Duboit, ARKEMA*
13:50 -14:10	Bio-composites based on forest derived materials and biodegradable polymers	*Patrizia Cinelli,* *University of Pisa*
14:10 – 14:30	Bio-refinery multi-product opportunities for industrial crops as feedstocks	*Ralph Sims, IPCC*
14:30 – 16:00	**Round Table:**	

Topics: 1. Restricting factors limiting broader industrial use of other specialty crops (supply, costs, physical traits, consistency in quality, technical performance, economic viability and security of the investment, etc.)

2. Prospects to widen the range of potential feedstocks

3. Research gaps and recommendations

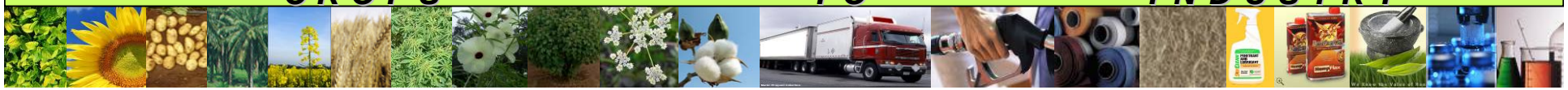
1st Thematic workshop
‘Can fibre crops offer a viable alternative land use option and could they support a competitive industry ?’

2nd Thematic workshop
‘Carbohydrate crops and the dilemma of using them for non-food purposes’

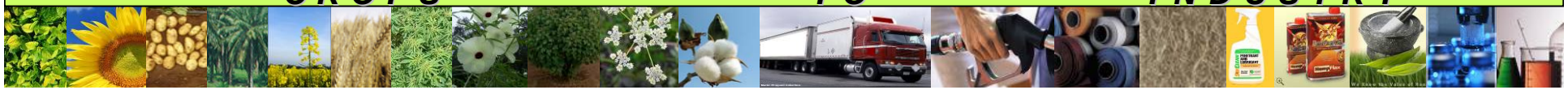
Some remarks from the previous workshops

- The shortage of science and technology does not seem to be an issue but putting the supply chain together and attract the market, which is fed by imports of low-cost raw material, is the real challenge. However, research on improving crop yields and technology efficiency is still imperative.
- Consistency in feedstock and bio-product, poses challenges for speciality products or special feedstocks (in terms of chemicals).
- A structure for prioritisation of the uses of main products and by-products is needed. The biorefinery concept is recommended because it improves the overall efficiency of the industrial plant by exploring all by-products for several uses.
- From the industrial part, more innovation in product development is needed, in order to promote investments.

- To attract investors the projects have to be bankable, else the investor is not going to have any support from the banks.
- Low prices of biomaterials will certainly attract customers
- Assessment of cost variables is required in order to estimate profits of the investments. Market appraisal and sensitivity of the costumers to the product quality and price is required in order to promote investments.
- Profitability is a decisive motive for crops to be cultivated. Which crops to grow depends on the latitude, security of supply, sustainability criteria and its final uses.
- As there are big markets, like the biofuels, and with small markets, like plastics, detailed business plans for crops are crucial. Bioenergy as a product is easy. The high value of low tonnage products shouldn't be overlooked.



- CAP impact is huge. Any investment decision need long term financial stability. Social motives may still be in need for subsidies. Biomass need the same playfield as the other renewable, thus subsidies have to be put in the right direction and there must be a clear plan on how to remove them, because crop financial profitability should stand alone.
- Security of investment is a long-term EU - governmental issue. We have to pass the message to policy makers that we need stability of science and stability of investment.
- For all the above reasons, public awareness has to be increased. Targeted workshops open to all relevant stakeholders, from farmers to end-users are important for the industry as well as for the investments.



Thank you for your attention

and your presence in our workshop!

Topics for discussion

1. Restricting factors limiting broader industrial use of pharmaceutical and other specialty crops crops (supply, costs, physical traits, consistency in quality, technical performance, economic viability and security of the investment, etc)
2. Prospects to widen the range of potential feedstocks
3. Research gaps and recommendations