

# Bioeconomy in Greece and the Greek Bioeconomy Forum

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#### Bioeconomy policy around the world



https://www.tni.org/files/publication-downloads/tni primer the bioeconomy.pdf

# **Bioeconomy in figures - 2016**



#### **Biomass for Food and Feed Industry**



**Biomass remains largely unexploited in Greece & worldwide** 

On average, around 14% of the total biomass is exploited around the globe (mostly in the field of energy).

#### 1 ton of biomass is equivalent to about 0.4 tonnes of oil.

#### Sources:

- 1. <u>https://www.export.gov/article?id=Greece-Agricultural-Sector</u>
- 2. IOBE-2016 http://www.sevipa.gr/blog/iobe-e-biomechania-trophimon-kai-poton-echei-te-megalytere-symbole-ston-tomea-tes-metapoieses

#### Greece

- In 2017 the agricultural sector contributed with 4.1% to the Gross Domestic Product (GDP) where 70% was agricultural product and 30% animal product [1].
- The domestic food industry covers more than 1/4 (26%) of all businesses in Greek manufacturing [2].



#### Unexploited wastes



#### Greece:

It is estimated that annual <u>waste generation</u> in Greece is **57.983.751 tn / y,** including agricultural and industrial waste (53%) and livestock manure (47%).

Based on their anaerobic treatment scenario, 21.9 TWh of electricity can be generated, accounting for 39% of the gross electricity consumption in Greece.

Source: EUBIONETIII project partners (2012) - <u>https://www.researchqate.net/figure/257547972</u> fig8\_Fig-8-Amounts-of-unexploited-agro-industrial-residues-in-selected-EU-member-countries https://www.youtube.com/watch?v=ZxmyleZb1go

#### Management of solid wastes in Europe & Greece



http://ikee.lib.auth.gr/record/136056/files/GRI-2015-13998.pdf Fortune 2017: http://www.fortunegreece.com/article/ta-dila-vimata-tis-elladas-pros-tin-kikliki-ikonomia/

#### **Biomass for materials**



http://www.connectivityweek.com/2012/hack

Production of platform chemicals and products through the bio-refinery process.

**In Greece bio-refineries** for the production of chemicals and products are available basically **only in lab/pilot scale**. However recently there are some few initiatives for the establishment of commercial units.



## Biomass for renewable energy & fuels

Greece has considerable renewable energy potential, which has already attracted investment interest





Locations of biodiesel plants in Greece

Today, Greece has

- ✓ 25 biogas plants
- ✓ 12 biodiesel plants 130,000 m<sup>3</sup> biodiesel mostly from sunflower and some rapeseeds = 93% of the biodiesel consumed in Greece

Sources: CRES, 2018

Fortune 2017-http://www.fortunegreece.com/article/ta-dila-vimata-tis-elladas-prostin-kikliki-ikonomia/

#### Energy sector in Greece - 2011



Source: EU, DC Energy A1-June 2011, ESTAT, EC FIN, EEA

ec.europa.eu/eurostat

# Forecast of renewable energy (RE) penetration in the Greek market



The National target for the share of energy from renewable sources in gross final consumption of energy:



Source: http://www.ypeka.gr/LinkClick.aspx?fileticket=CEYdUkQ719k%3d&tabid=37

## Bright future for renewables (global)



Source: https://www.iea.org/weo2017/

#### Barriers for the development of Bioeconomy in Greece

- Lack of public awareness on the environmental benefits
- Disorganized and costly supply chain of raw materials
- Huge bureaucracy
- Unstable and inefficient policy
- Low technical training around Bioeconomy
- Instability of institutional and taxation environment
- Lack of substantial efforts to create a framework for the marketability of 'green' innovations

## The Greek Bioeconomy Forum (1/4)



- Who we are: A group of people from different disciplines with expertise on different aspects of the Bioeconomy.
- Our vision: the wide spread of the idea of the bio-economy across Greece
- **Targets**: contribute to accelerating the transition to a sustainable, resource-efficient economy by
  - Promote Bioeconomy advantages
  - Influence policy at National/Regional/Local level
  - Support the development & dissemination of a National Action Plan for Bioeconomy
  - Improve public awareness regarding
    - what is possible through re-use and recycling
    - how we produce, use and consume products in a Bioeconomy

http://bioeconomyforum.gr/



Activities so far:

- □ Website (in Greek & English) that provides
- info and activities relative to BioEconomy, like
  - EU documents
  - EU & National calls for funded projects
  - News for events (globally)
- Activities that improve public awareness and motivation like the

1<sup>st</sup> Greek photography contest (available only at the Greek version of the website).

**Twitter account** (76 followers and following 109)



1°<sup>ς</sup> Ελληνικός Διαγωνισμός Φωτογραφίας για την Βιο-οικονομία



http://bioeconomyforum.gr/)

## The Greek Bioeconomy Forum (3/4)

**Electra Papadopoulou** 

CHIMAR HELLAS SA

Ex- EU Bioeconomy Panel

on BioPolymers/

member

Chemist - Senior Researcher



Today the Forum has about 50 people although the membership applications are increasing rapidly.



Dr. Yannis Fallas Director CluBE Senior Bioenergy

Cluster Researcher

Member of EU B/E stakeholders Panel

# People leading the initiative



**Constantine Vaitsas** 

Internationalisation and Innovation expert

Member of the States Representatives Group of the Bio-based Industries Joint Undertaking (SRG BBI)



Prof. Dr. Constantinos E. Vorgias

**Director of Master for Bioinformatics** 

Member of the Greek National Research and Techonology Committee (NRTC, Energy Section)



**Prof. Dr. Emmanuel Koukios** 

Emeritus of Organic Technologies at the National Technical University of Athens, Greece

http://bioeconomyforum.gr/)

# The Greek Bioeconomy Forum (4/4)



 Support from authorities (Local/National/EU). Get involved with the Bioeconomy forum

http://bioeconomyforum.gr/#get-involved

 Collaboration and networking with other relative initiatives in EU.



## Other Initiatives in Greece regarding Bioeconomy

#### • Two Master programs in Bioeconomy:

- In Athens (MSc in Bioeconomics) by the Economical department of the University of F in cooperation with the Biology department of the National and Kapodistrian University of
- <u>In Thessaloniki (</u>MSc in Bioeconomy: Biotechnology and Law) by the International Hellenic University.

#### Crete has drafted its regional Bioeconomy Profile

(<u>http://sbhss.eu/files/Ovrigt/Case-Study-Report-Crete\_EL.pdf</u>)

#### • Companies





## **Companies with Bioeconomy activities**



BINDING INNOVATION - Serving the Resin & Wood panel industry worldwide since 1977

Use of bio-based materials in the production of wood-based panels, like

- Microalgae,
- Whey,
- Cellulose,
- Raw-materials from the recycling of cloths,
- Chemicals from the biorefinery of Agricultural and Forestry wastes

Licensing Technology around the world

expertise in 40 countries

>38 years

#### Conclusions

- Greece has a high potential for Bioeconomy developments in various sectors.
- An intense interaction is necessary between industrial, academic, and socio-economic stakeholders.
- Key points:
  - Bioeconomy policies at each EU country
  - Development of a coherent European framework—under which all policies that encompass Bioeconomy sectors can develop.



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Member of the EU Bio-economy panel (2013 – 2015)

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# Thank you very much!