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Conceptual vision for Mediterranean Regions for Sustainable Development via Waste-based Bioeconomy

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MW, Napoli, 23-24 October 2017

How to define the Mediterranean world



Mediterranean basin



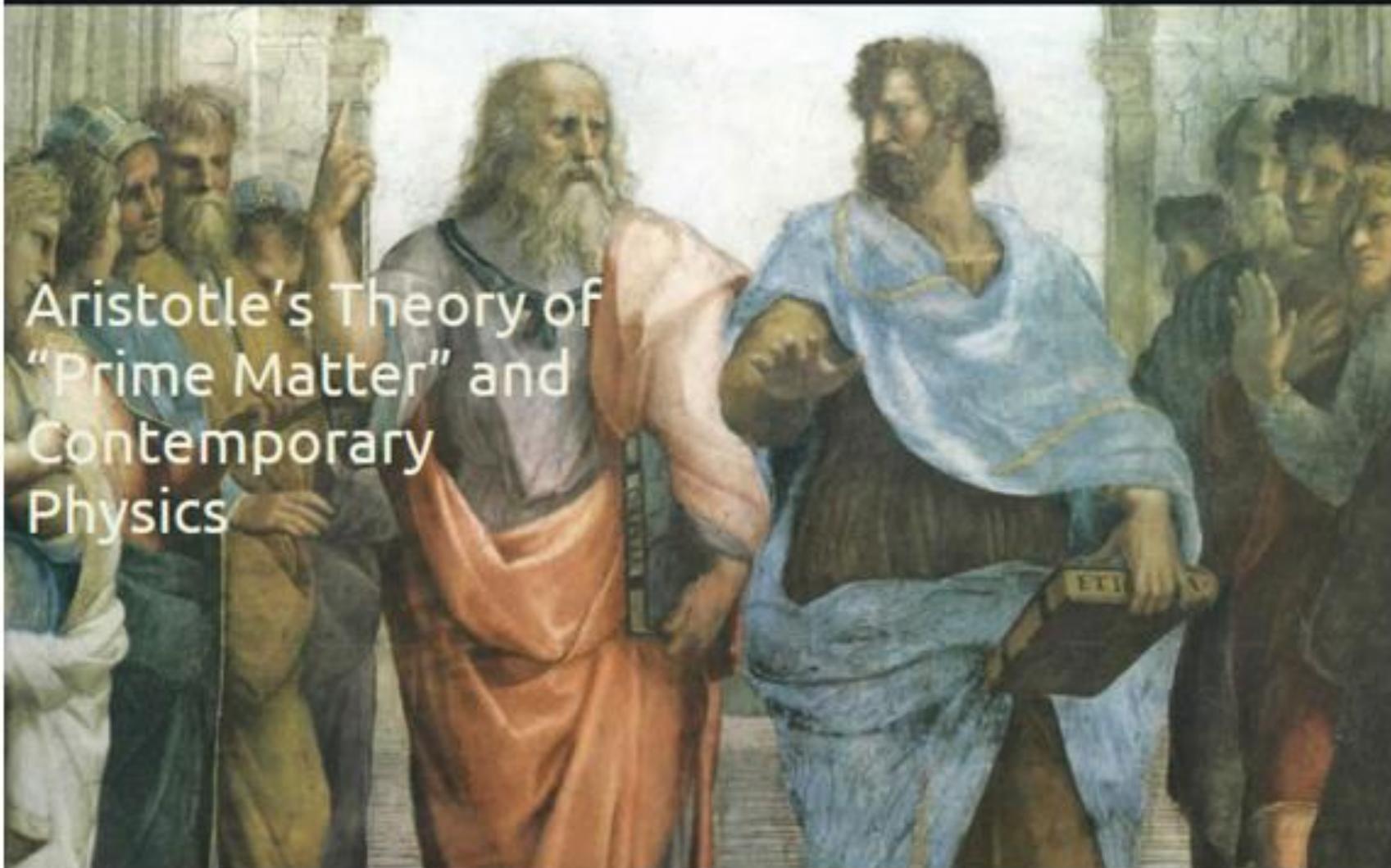
The Mediterranean is

a geographical, cultural, and philosophical reference point,



The Mediterranean is light and poetry





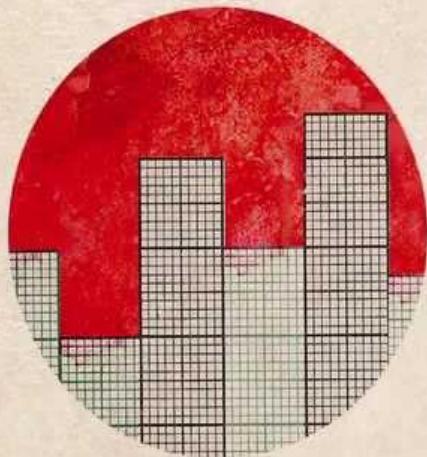
Aristotle's Theory of “Prime Matter” and Contemporary Physics

CHALLENGES WE FACE TODAY

Beyond Climate Change



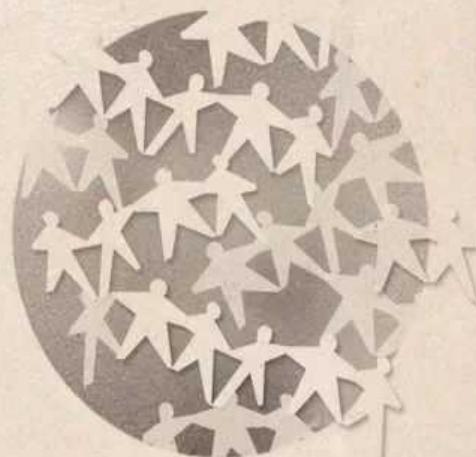
GREEN ECONOMY=



+



+



**LOW CARBON
GROWTH**

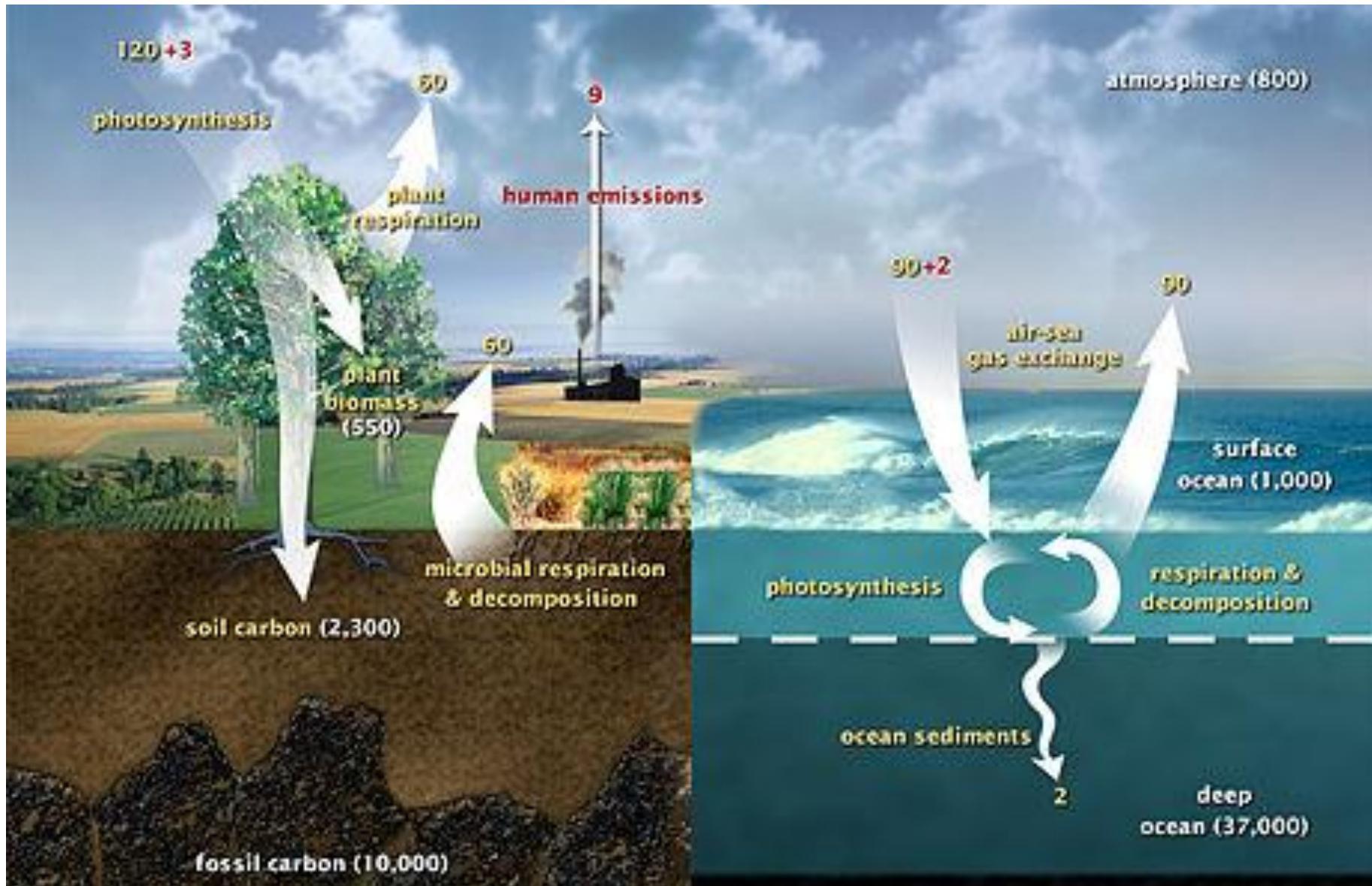
**RESOURCE
EFFICIENCY**

**SOCIAL
INCLUSIVITY**

=SUSTAINABLE DEVELOPMENT?

We are lucky.....

Terrestrial and Marine Biomass



Strategic objectives

BIO ECONOMY

One of the main pillars of green growth and sustainability

the **Sustainable Development Goals**

WHY Bioeconomy

- Sustainable and safe food production for growing population,
- Developing new and more environmentally friendly sources of energy
- Combating global warming
- Employment

Application.....Bio-industry

It includes sectors such as

agriculture,

forestry,

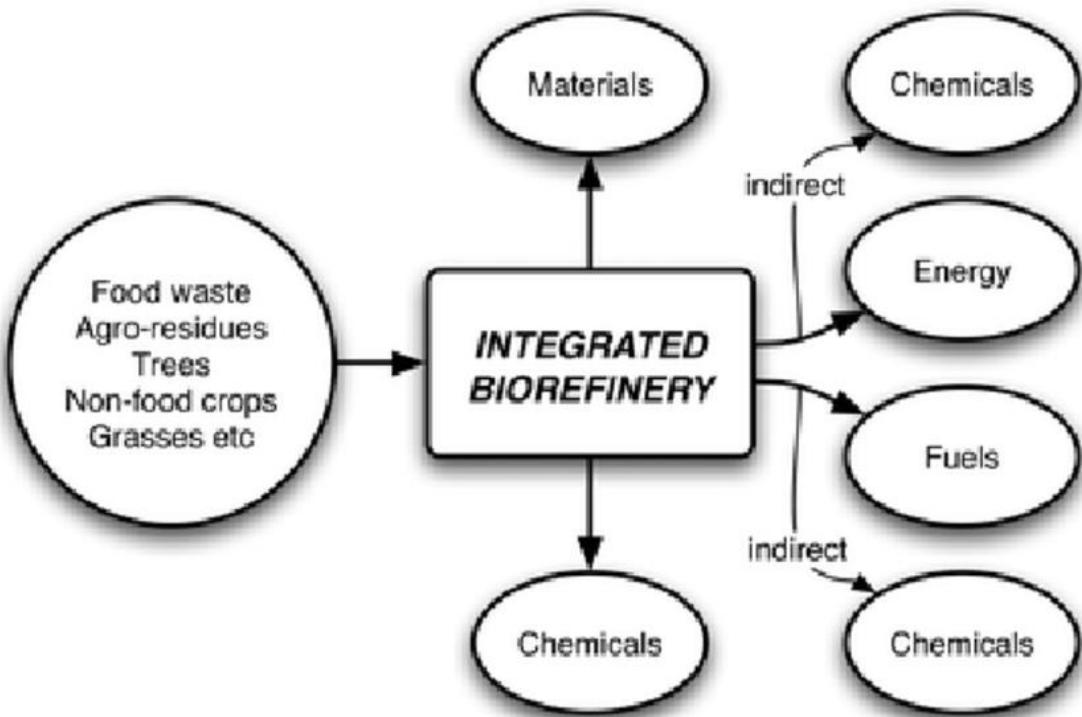
fishing,

food and paper production and
energy industries.

biofuels,
biopower,
bioproducts.



Biorefinery approach



A biorefinery might, produce one or several **low-volume**, but **high-value**, chemical products and **low-value**, but **high-volume** liquid transportation fuel, while generating **electricity** and process heat for its own use and perhaps enough for sale of electricity.

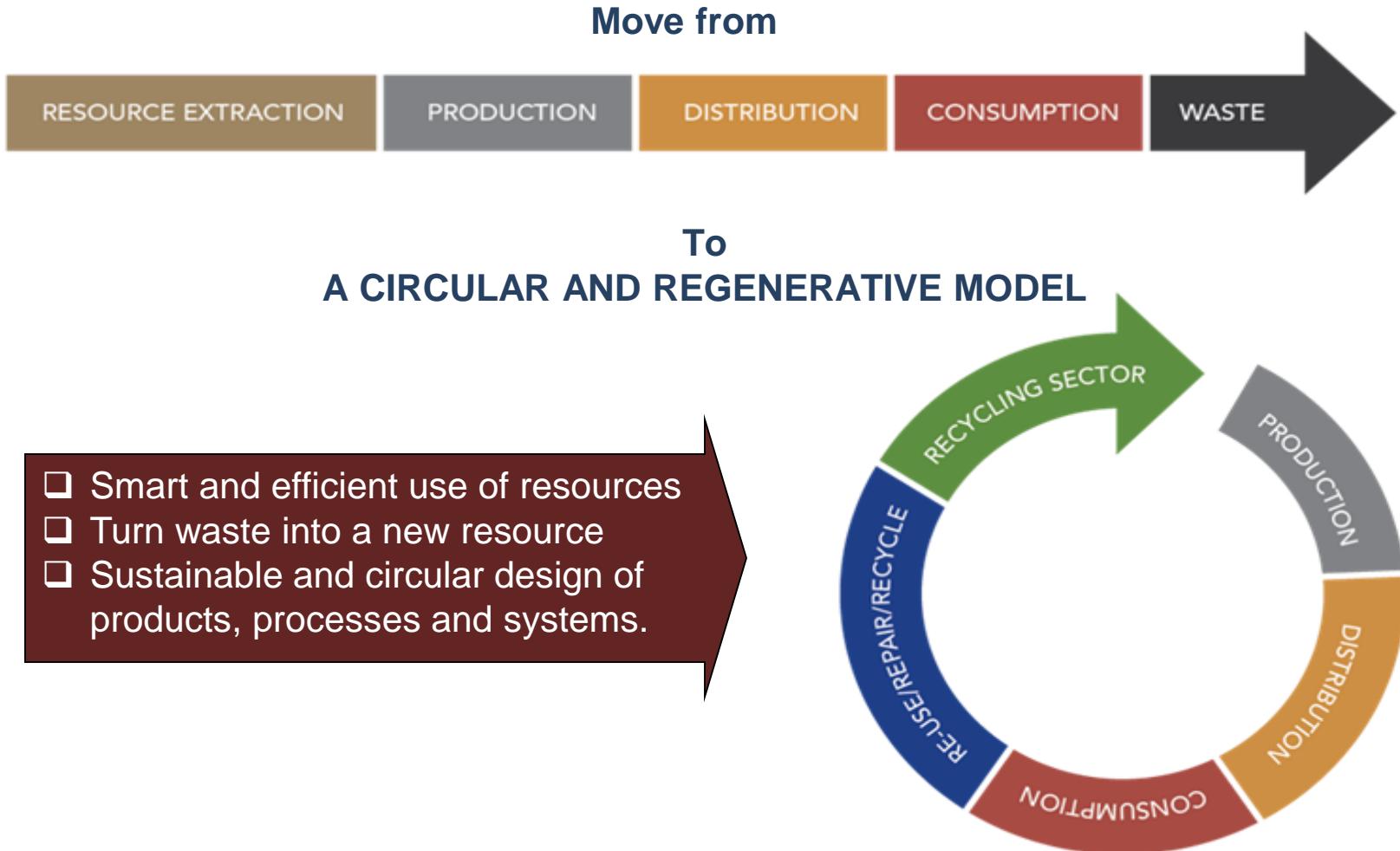
The high-value products **enhance profitability**, the high-volume fuel helps **meet national energy needs**, and the power production **reduces costs and avoids greenhouse-gas emissions**.

CIRCULAR ECONOMY

The 7th EU Environment Action Programme to 2020

Toward circular economy

EU target: To develop a competitive, resource efficient and low carbon economy by 2050.



Vision for Mediterranean



The manifesto of Messogiorno



Journal of Cleaner Production

Available online 5 May 2017

In Press, Corrected Proof — Note to users



Targeting sustainable bioeconomy: A new development strategy for Southern European countries. The Manifesto of the European Mezzogiorno

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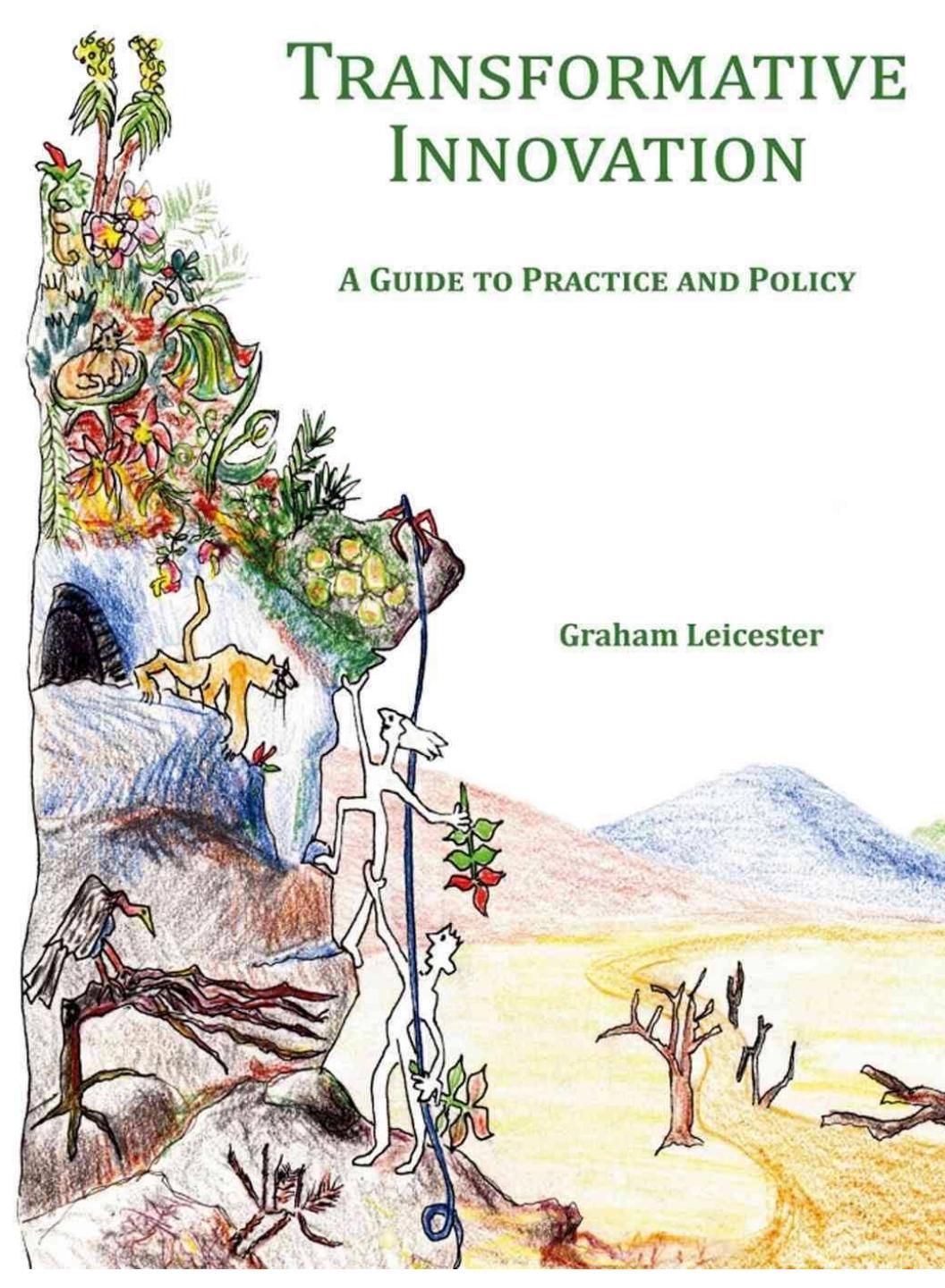
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TRANSFORMATIVE INNOVATION

A GUIDE TO PRACTICE AND POLICY

Graham Leicester

Sustaining innovation improves efficiency and prolongs the life of existing systems.

That is the practice of Transformative innovation, shifting the whole system over time to a new viable pattern fit for the future.

Local Resources Availability

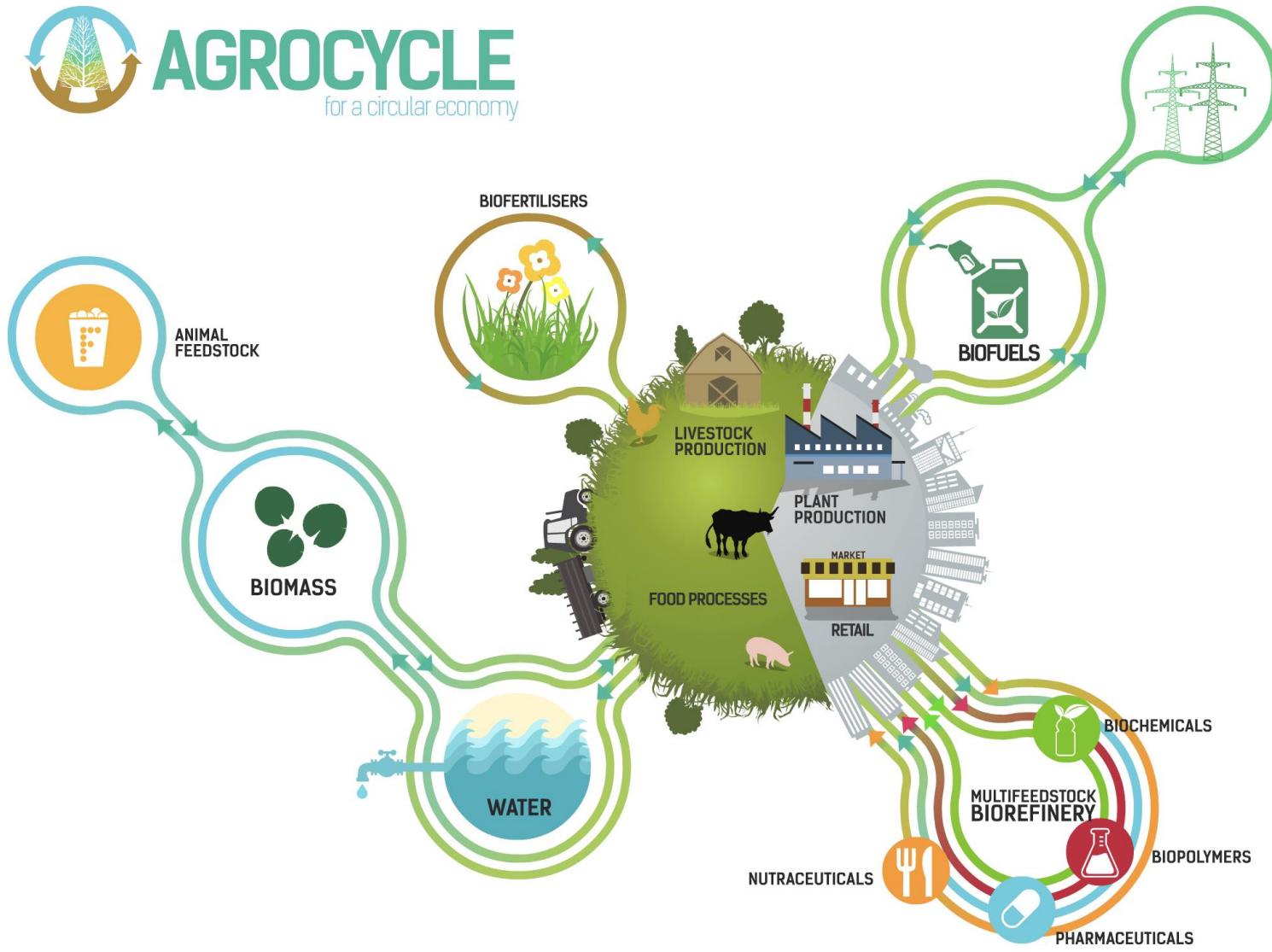
SOUTH



NORTH



Agro-industrial residues based Circular bioeconomy



The **Mediterranean** Sea is a basin with unique
..... of marine **algae**, microbes, enzymes, and by-
products.

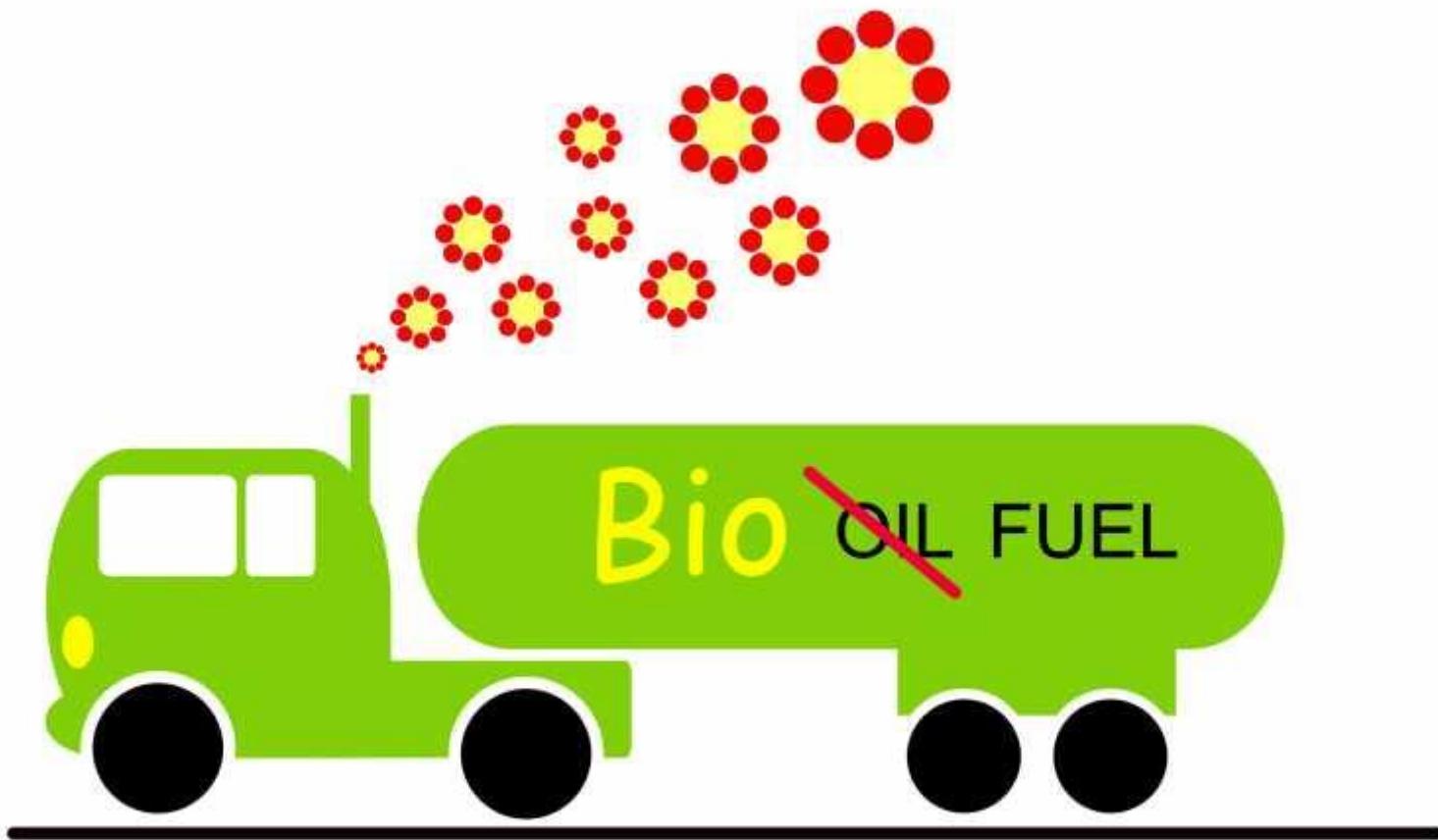


A national resource efficiency programme should be prepared.

- **Business opportunities** created by the need to restore and close material cycles should be promoted.
- Their **effectiveness should then be tested in practice.**

LARGE SCALE

Thermochemical for transport biofuels



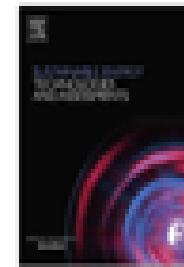


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Original article

Conceptual vision of bioenergy sector development in Mediterranean regions based on decentralized thermochemical systems

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ARTICLE INFO

ABSTRACT

Tailor made solution

Agro-industrial sector



Mobile Pyrolysis



Biochar-closing the loop



Environmental Development

Volume 14, April 2015, Pages 22–36



Boosting circular economy and closing the loop in agriculture:
Case study of a small-scale pyrolysis–biochar based system
integrated in an olive farm in symbiosis with an olive mill

A. Zabaniotou^{a, b}, , D. Rovas^a, A. Libutti^b, M. Monteleone^b

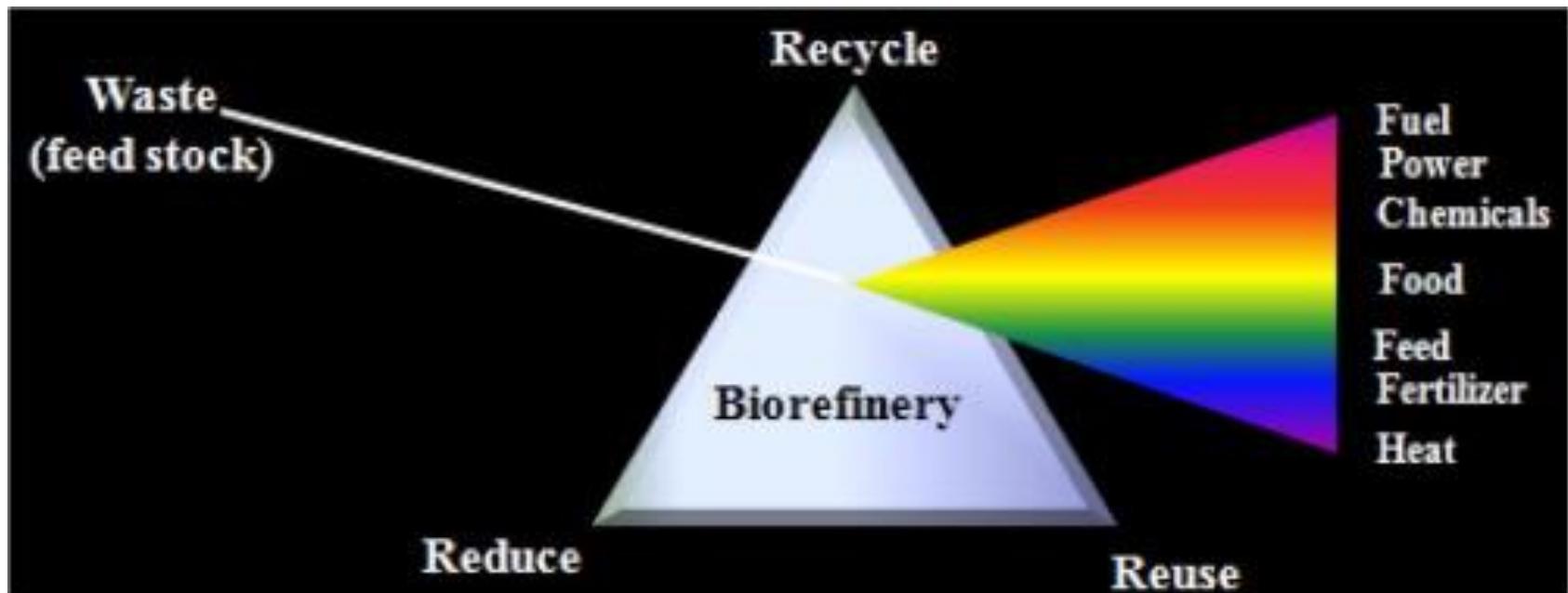
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<https://doi.org/10.1016/j.envdev.2014.12.002>

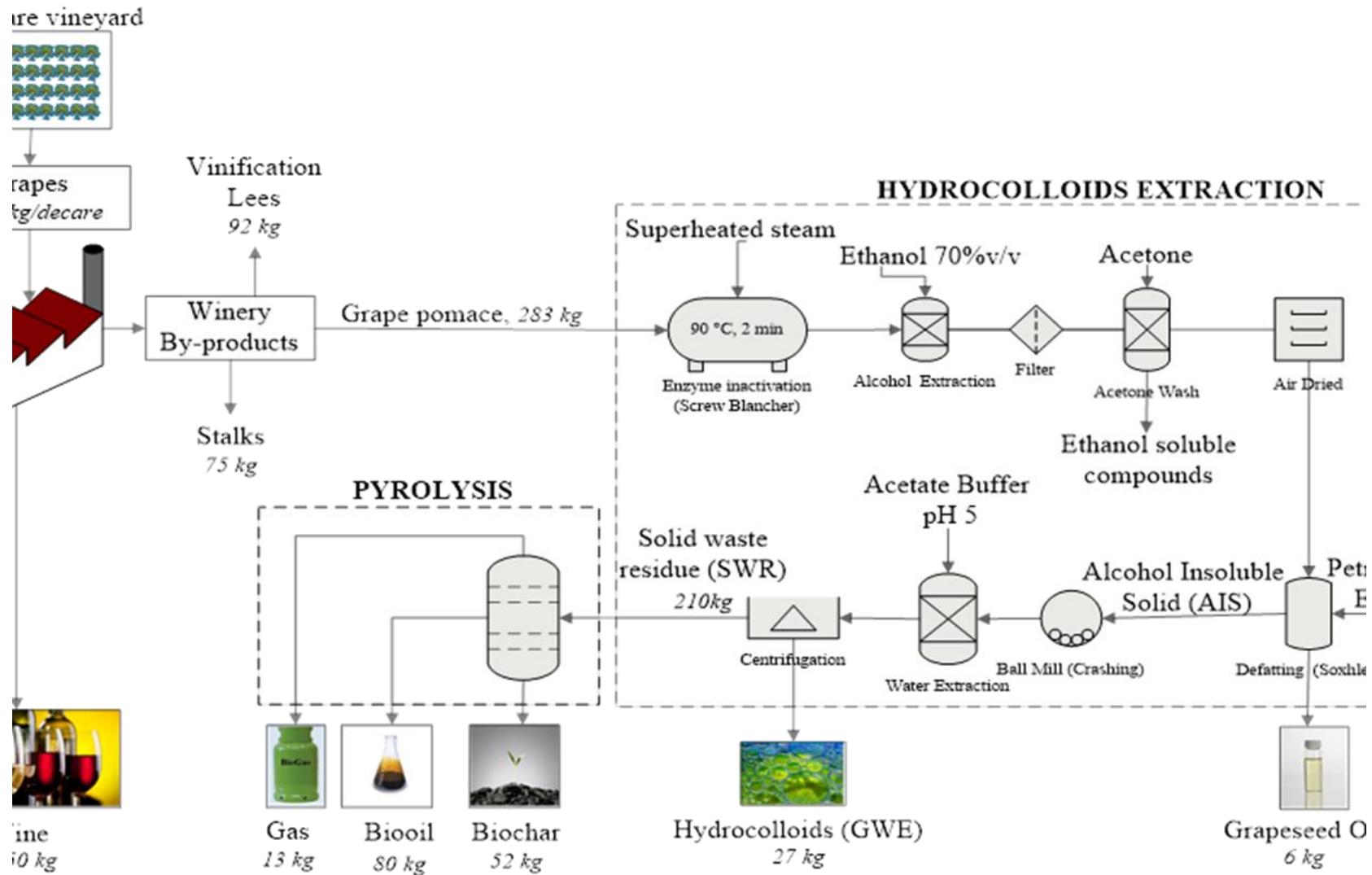
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Industrial Symbiosis

Waste biorefinery models



Winery cascade biorefinery



Local biorefinery activities should be created as regional networks

- **Biorefineries**
- The establishment of biorefineries that process organic materials to produce energy and new raw materials should be promoted.
- Technologies and business models should be developed to promote the utilisation of **diverse local biomaterials through regional networks**.
- Models for the development of **logistics chains** for biomaterial procurement and new purification techniques should be created and tested.

ENVIRONMENTAL, SOCIAL & ECONOMIC METRICS





Available online at www.sciencedirect.com

ScienceDirect

Current Opinion in
Green and Sustainable Chemistry

Social acceptance of bioenergy in the context of climate change and sustainability – A review

D. Fytilli and A. Zabaniotou



Towards a collaborative Model

Its not simple

Creating regenerative systems is not simply a technical, economic, ecological or social shift:

it has to go hand-in-hand with an underlying shift in the way we think about ourselves,

our relationships with each other and planet

with life as a whole.

Broader view

We need to apply a broad view on **regional development** including the importance of

- natural and
- cultural heritage to
- human health,
- well-being,
- social inclusion and
- local identity.

To preserve the beauty of Mediterranean

**ethical, ecological, sustainable
practices**

at the local, European and Global
scales.

**Intercultural, multidisciplinary and
systemic approaches are essential**

with WISDOM

**For resilient Mediterranean
communities**

We have to remember...

Be aware

Thank you

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