

Nov 29<sup>th</sup> - Nov 30<sup>th</sup>, 2017 Workshop on  
**Second Generation Bioethanol and Biorefining**  
Campinas, Brazil

## Drives, Directions and Challenges

Round Table:  
Accelerating the Bioeconomy

Nov, 2017 - Raquel Coutinho

# Accelerating the Bioeconomy

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## Evolution of Bioeconomy definition

“Bioeconomy refers to the set of economic activities relating to the invention, development, production and use of **biological products and processes**” (OECD, 2009).

“The production of renewable biological resources and the **conversion of these resources and waste streams** into value added products, such as food, feed, bio-based products and bioenergy” (European Commission, 2012).

“The global industrial transition of sustainably utilizing renewable aquatic and terrestrial biomass resources in energy, intermediate, and final products for **economic, environmental, social, and national security benefits**” (USDA, 2014).

bioeconomy ↔ biobased economy ↔ circular economy

“The bioeconomy is as old as human kind.”

What is the actual “speed”?

How do we measure the speed?

### Concepts of measuring progress in Bioeconomy

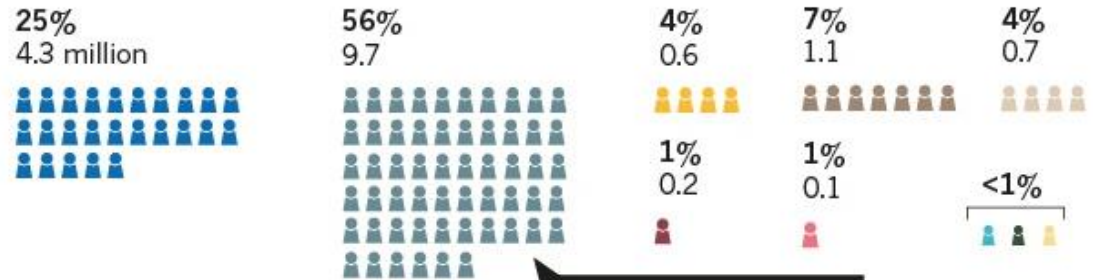
1. **traditional**: bioeconomy as a share of GDP and employment.



# Bioeconomy breakdown

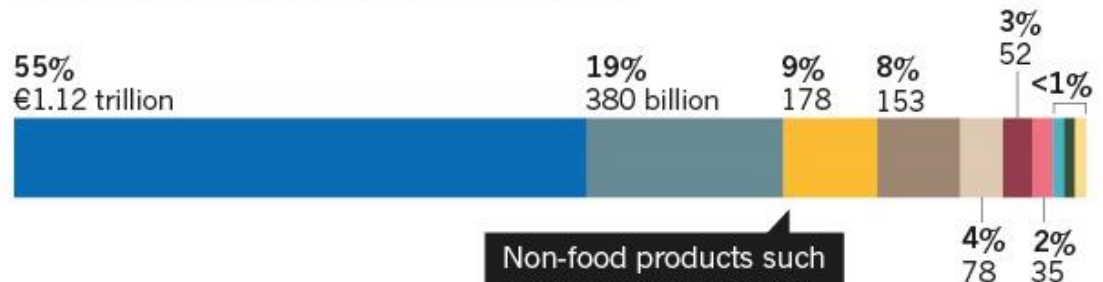


## A EU's bioeconomy employment: 17 million jobs



Agriculture dominates jobs, whereas food creates most profit.

## B EU's bioeconomy turnover: €2 trillion



Non-food products such as paper, furniture and textiles generate about €480 billion.

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## More than 40 nations are proposing to boost their “bioeconomy”

## Bioeconomy Policies around the World



## Accelerating the Bioeconomy

BUT

Conflicting national **priorities** make it hard to align **bioeconomy policies** to meet the SDGs (UN Sustainable Development Goals - food security, energy access and health) on a global scale.



What is the “Bioeconomy” that we need to accelerate?

### Concepts of measuring progress in Bioeconomy

1. **traditional**: bioeconomy as a share of GDP and employment.
2. **physical**: share of renewable biobased content in the economy's products and services.

Survey of consumers in the U.S. and the E.U:

- 80% to pay an additional 5 % for renewable content.
- Less than 10% would pay a 25 %.

What makes the “Bioeconomy” a different sector of economy  
... and that we need to accelerate?

## Accelerating the Bioeconomy – Searching for balance

- Climate change
- Sustainability
- Limited natural resources
- Feedstock handling and supply
- Private and public policy
- Disruptive technology risk
- Innovation opportunities
- Uncertain market condition
- Limited technological data
- Economic feasibility



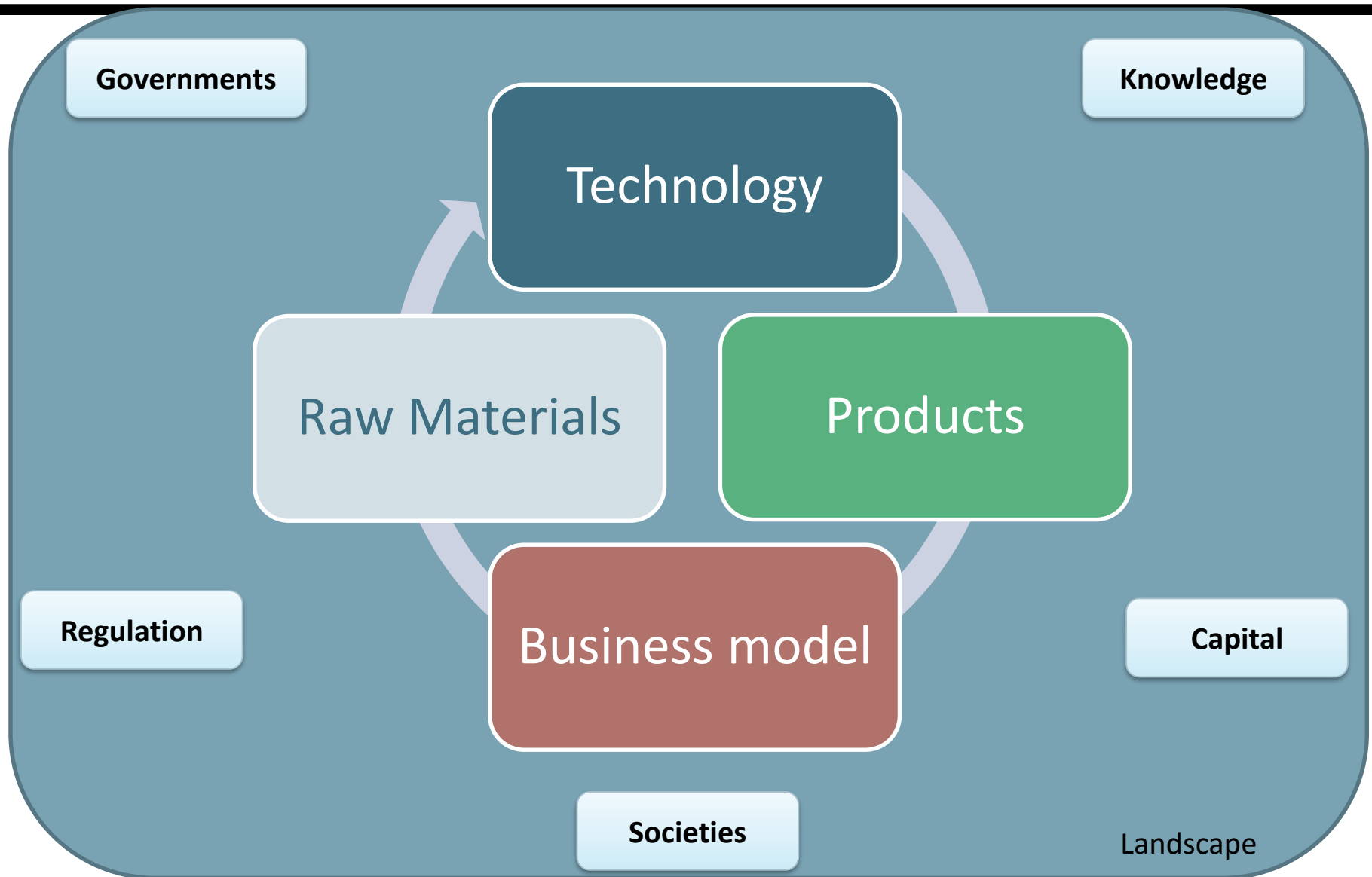


### Concepts of measuring progress in Bioeconomy

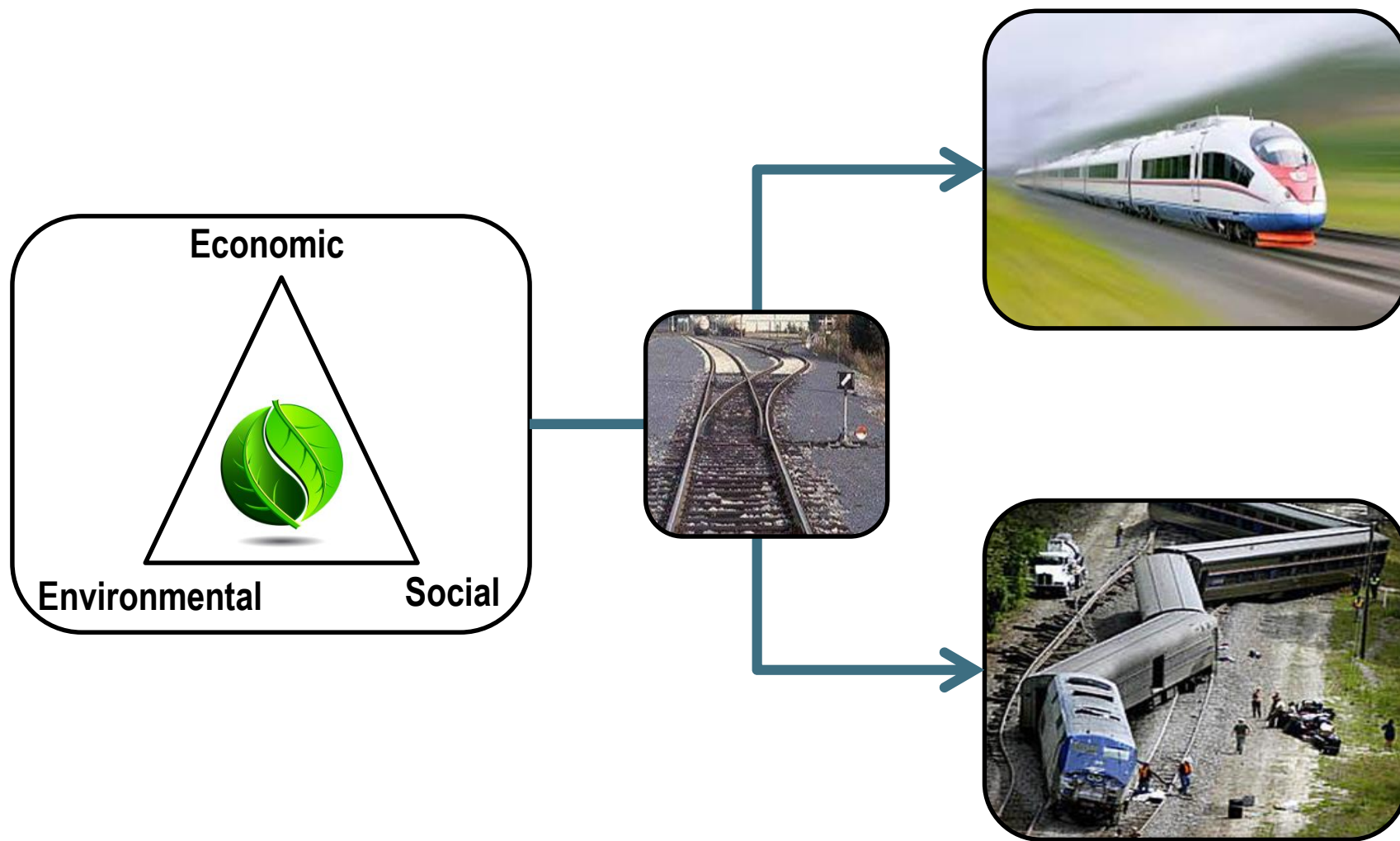
1. **traditional**: bioeconomy as a share of GDP and employment.
2. **physical**: share of renewable biobased content in the economy's products and services.
3. **pervasive**: outcome measures (reduced carbon emissions, sustainability of water, soil, biodiversity, including non-price measurement). Well-being of people.

Source: Justus Wesseler, Joachim von Braun. 2017. Measuring the Bioeconomy: Economics and Policies. *Annu. Rev. Resour. Econ.* 2017. 9:17.1–17.24

## Accelerating the Bioeconomy – Challenges



## Accelerating the Bioeconomy – Searching for balance



Key question:

How do we evaluate the impact of promoted actions?

