

# ***Biorefinery – Pros and cons from Cost Action FP0901***

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## *Does Biorefinery Concept Is a Shift of Paradigme?*

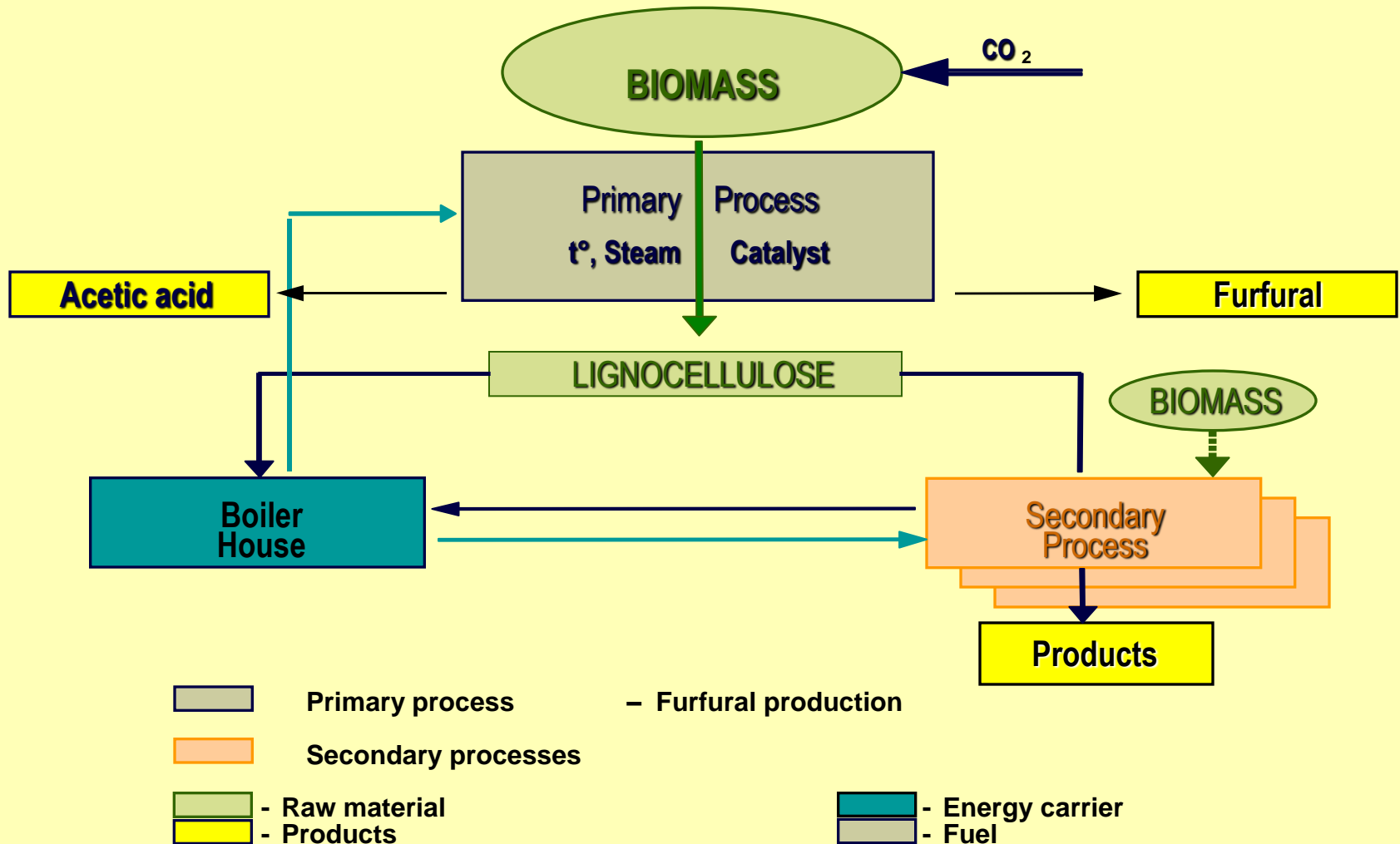
- The Oxford English Dictionary defines the basic meaning of the term paradigm as “a typical example or pattern of something; a pattern or model.”
- The physicist Thomas Kuhn in his book “The structure of Scientific Revolutions”(1962) defines a scientific paradigm as “universally recognized scientific achievements that, for a time, provide model problems and solutions for a community of researchers

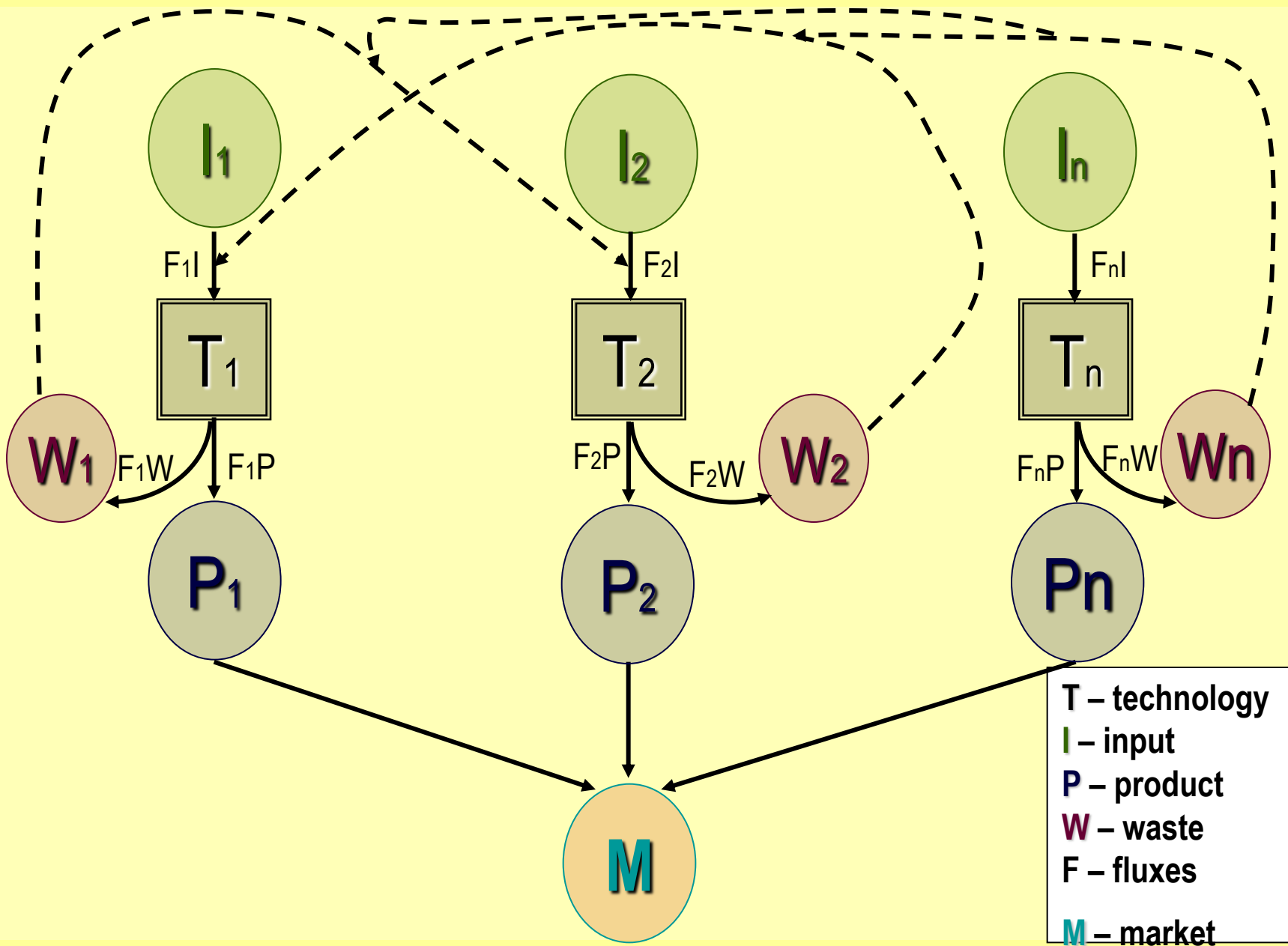
**I do not have a certain answer**

## ***What is a biorefinery?***

- **A biorefinery is a cluster of technologies integrating conversion of biomass into transportation fuels, power, chemicals, and advanced materials within the framework of zero emissions. (LSIWC/LBEEC)**
- **„Biorefineries combine the necessary technologies between biological raw materials and industrial intermediates and final products. The principal goal in the development of biorefineries is defined by the following: (biomass) feedstock-mix + process-mix → product-mix” (Kamm)**

# A BIOMASS-BASED PRODUCTION SYSTEM





# *Materials*

- Wood

- Hemp

- Flax

- Straw



Hemp

# *Biomass Treatment Methods*

- Steam explosion
  - Ball grinding
- Ultrasound treatment
- Electro-Spinning



*Steam explosion unit*



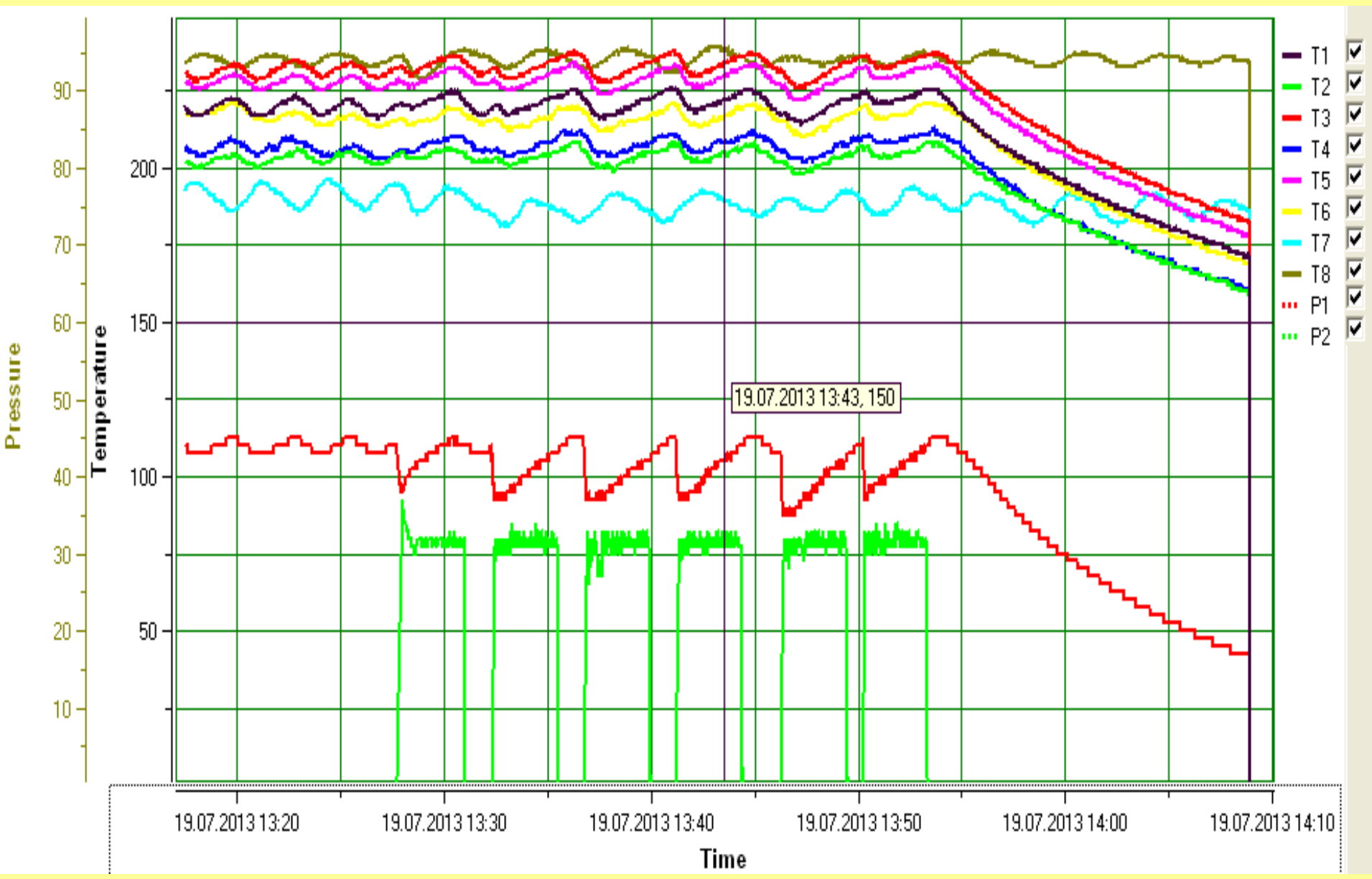
Steam generator



SE reactor



Control unit

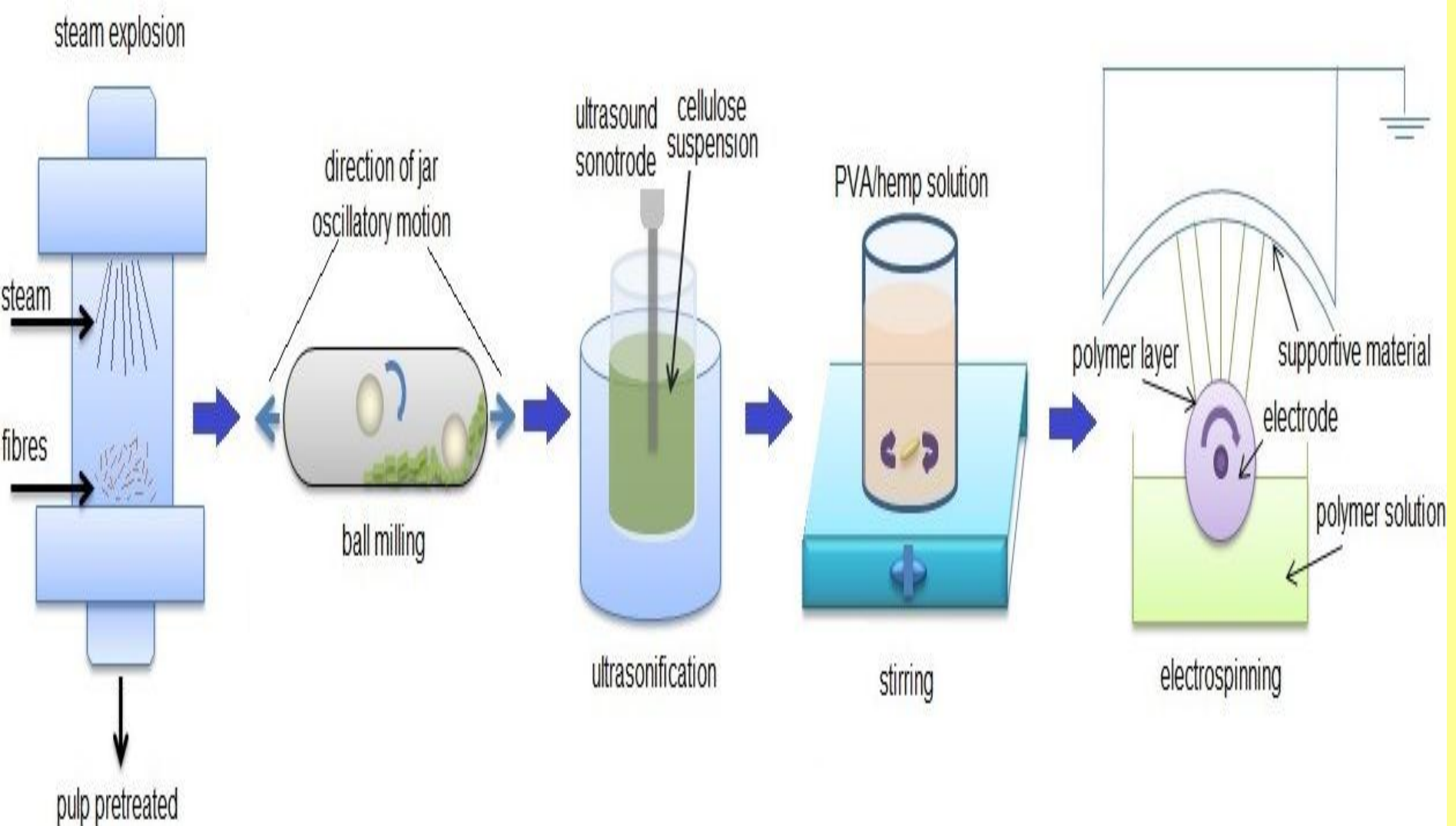




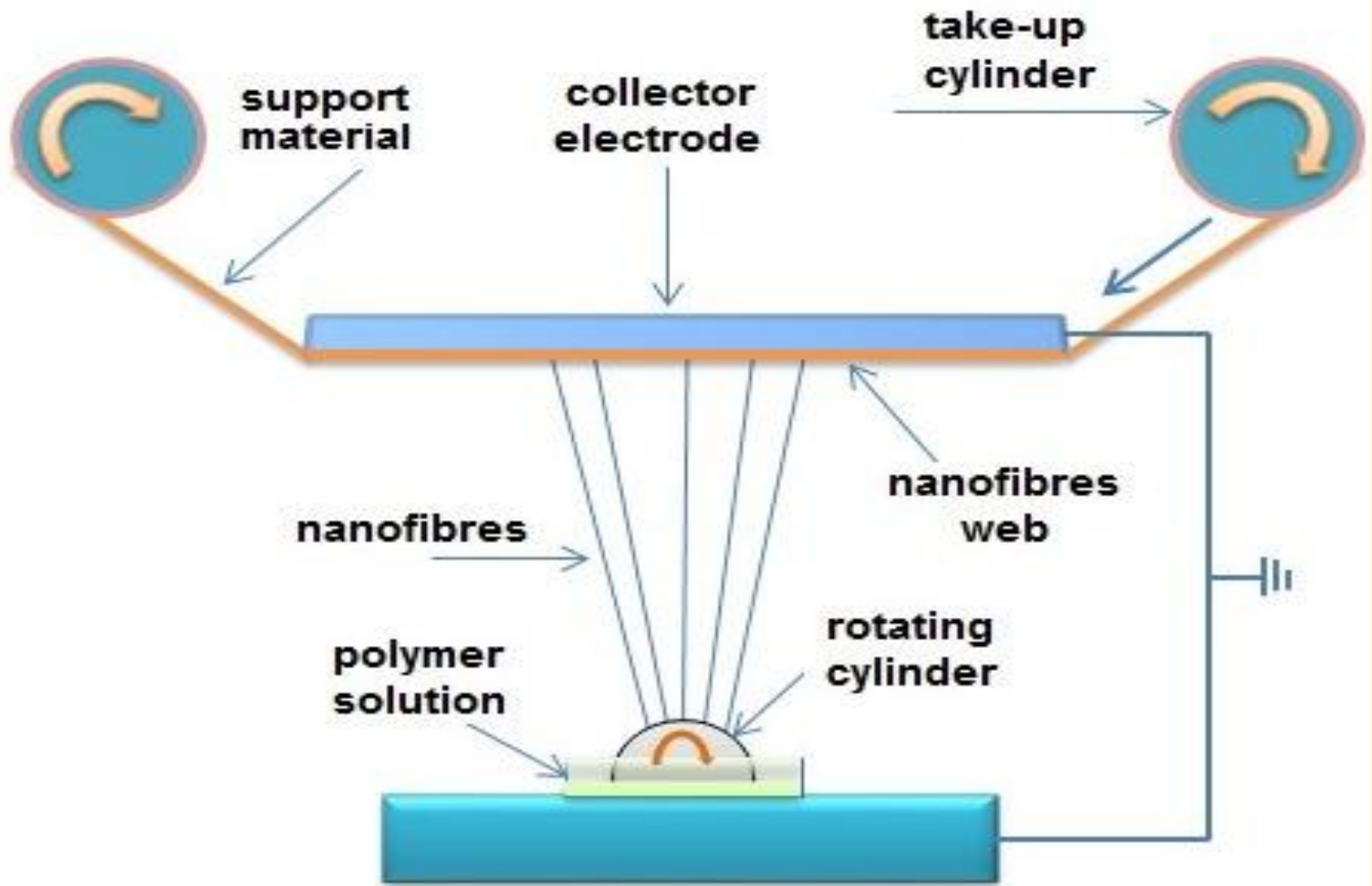
Untreated fibres



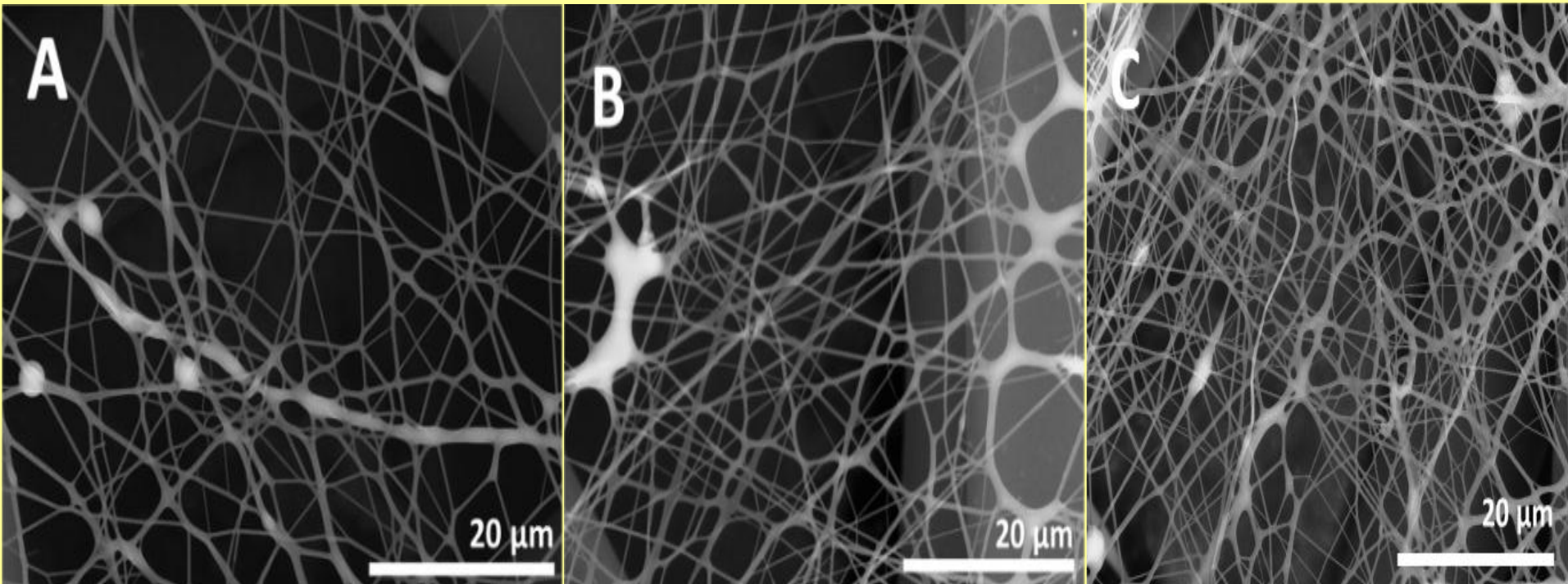
Steam exploded fibres



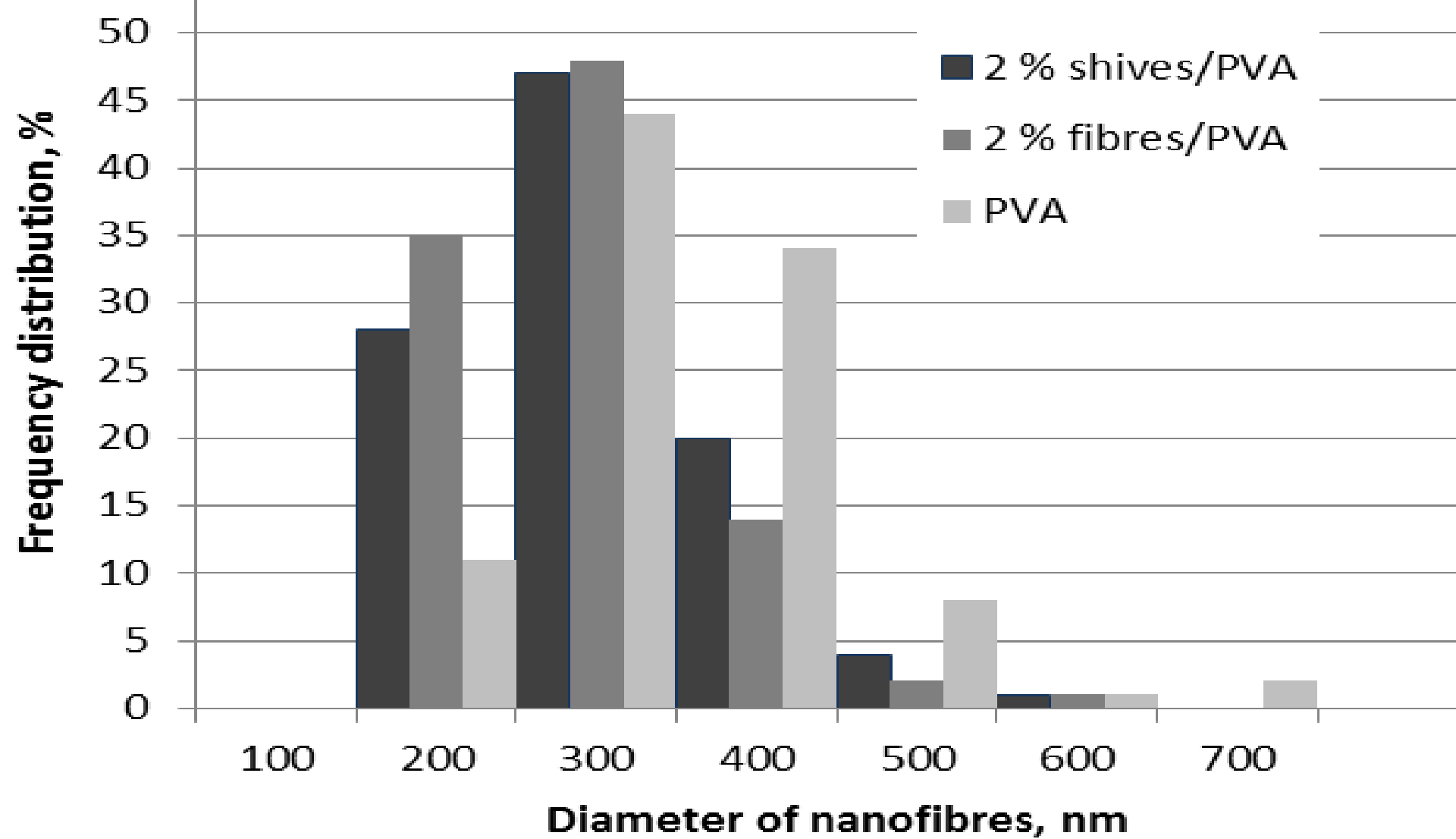
Natural fibres pretreatment and electrospinning



Scheme of electrospinning setup - "Nanospider" <sup>TM</sup>



SEM micrographs of the (A) – neat PVA nanofibres, (B) – PVA/NC-S 2% and (C) PVA/NC-F 2%



Distribution of the diameter of nanofibres from PVA, shives/PVA, fibers/PVA

# *Biorefinery Analytics COST ACTION 0901*

- Chemical methods

- FTIR

- PY – GS/MS

**Question: Does biorefinery need special analytical methods?**