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**“It is important to join forces to stimulate the commercial use of lignin in sustainable products”**

## Who are we

*By the Action chair Richard Gosselink*

In this first Newsletter from the LignoCOST network (CA17128 - Establishment of a Pan-European Network on the Sustainable Valorisation of Lignin) we will describe who we are and what our aim is.

Lignin is removed during paper making and is released in the production of cellulosic ethanol. Currently, the base case for lignin is to use it simply as an internal energy source in the pulping and biorefinery industries. However, the industry is more and more convinced that economic valorization of this aromatic side stream is absolutely essential to make the processing of lignocellulosic feedstocks market competitive. In addition to those processes that consider lignin a side stream, much attention is nowadays given to the development of biorefineries, in which, next to cellulose, lignin actually is one of the main, high-value intermediate product streams to be further processed into a portfolio of biobased products, materials and secondary energy carriers.

To unlock the potential of lignin, an interdisciplinary and cross sectorial approach is needed by grouping relevant expertises within one pan-European network to tackle and overcome the challenges faced in industrial lignin valorization. **This fulfills our aim to stimulate the industrial application of lignin.**

LignoCOST brings together partners with outstanding and complementary expertises, active over the whole lignin value chain from production to applications. With over 260 participants from 36 European countries, 4 Near Neighbour Countries and 4 International Partner Countries a very strong network has been created.

## Working groups

LignoCOST has been organised via the following working groups:

**WG1** WikiLignin, tool for lignin information (Bernard Kurek, INRAE, FR, [bernard.kurek@inra.fr](mailto:bernard.kurek@inra.fr))

The purpose of WG1 is to develop a database comprising lignin sources, availability, properties and repository of state-of-the-art analytical methodologies and turn key methods for industry.

**WG2** Production and catalytic conversion technologies, including Technology Readiness Level (Pieter Bruijninx, UU, NL, [P.C.A.Bruijninx@uu.nl](mailto:P.C.A.Bruijninx@uu.nl)).

The focus of WG 2 is on bio- and chemo-catalytic conversion technologies including technology readiness level (TRL) assessment of ligno cellulosic raw material.

**WG3** Industrial application requirements versus lignin properties (Karolien Vanbroekhoven, VITO, B, [karolien.vanbroekhoven@vito.be](mailto:karolien.vanbroekhoven@vito.be))

The focus of WG3 is on industrial application requirements (market demand) versus lignin properties (supply). Bringing these two topics together will result in viable industrial opportunities for lignin application.

**WG4** Development of value chains for lignin valorisation (Per Tomani, RISE, SE, [per.tomani@ri.se](mailto:per.tomani@ri.se)).

The focus of WG4 is to create industrial viable opportunities for lignin valorisation by identifying industrial chains from supplier to end user. Development of value chains for lignin valorization.

**WG5** Technical and full sustainability aspects, LCA, market deployment, potential and implementation (Apostolis Koutinas, AUA, GR, [akoutinas@aua.gr](mailto:akoutinas@aua.gr)).

Life cycle analysis is an important tool for evaluating the opportunities for the implementation of lignin in industrial processes. WG5 will evaluate the LCA's for the most promising opportunities.

**“LignoCOST is formed by stakeholders from the whole value chain, including companies, RTOs and universities”**



1<sup>ST</sup> MC meeting in Brussels

## Results & Achievements

*By working group leaders*

**WG1** is developing a data base containing lignin literature over the last 50 years. A search tool is being developed and will be combined with the development of web site for easy access.

**WG2** has been working on gathering information on the various upstream technologies for lignocellulose processing and lignin isolation as well as on the various, general catalysis strategies under development that further convert the isolated lignins into valuable products.

**WG3** is working on the first deliverable, i.e., an inventory of relevant applications where lignin or lignin derivatives can replace fossil-based compounds. Therefore 7 different applications have been selected, namely: resins, marine fuels, flavours and fragrances, polymeric blends, asphalt, and adsorbents.

**WG4** The first value chain we started to cover is lignin phenol formaldehyde (LPF) resin applications. We have used this value chain to create a template for the coming work and today we have a draft version available for the network to comment. The documentation focus the commercialisation potential of LPF resins.

**WG5** participants have developed excel sheets with inventories of data for lignin properties and conversion processes into marketable end-products. Methodologies on techno-economic evaluation and LCA are currently under development. Finally, a link between LignoCOST and the research center ENEA-TRISAIA (Italy) has been created in order to collaborate within the international network IEA.



*STSM Meeting in Venice*



*Group photo of the Joint Working Groups & 3rd Management Committee meeting (13-14 November 2019, Regua, Portugal)*

## Dissemination & Communication

By the Science Communication Manager (Konstantinos Triantafyllidis, AUTH, GR, [ktrianta@chem.auth.gr](mailto:ktrianta@chem.auth.gr))

LignoCOST aims to coordinate and combine multidisciplinary knowledge and expertise and deliver high quality research and technological output. Joint reports and publications from different countries and groups is one of the primary objectives of the Action. Already in the first year, more than ten joint publications and conference presentations have taken place (<https://lignocost.eu/dissemination/>).

Communication of our activities to a wider spectrum of industry and potential markets, as well as towards the broader public, across the borders of Europe, aims to increase the awareness and acceptance of lignin and waste biomass derived fuels, chemicals and materials (<https://lignocost.eu/communication/>).

## STSMs

By the STSM Coordinator (Filomena Barreiro, IPB, PT, [barreiro@ipb.pt](mailto:barreiro@ipb.pt))

STSM is the acronym for **Short Term Scientific Missions**. This tool within the COST action allows researchers to visit other labs within the EU for a short stay of several weeks to a longer stay of 3 – 6 months. The STSM coordinator in this COST action is Please contact her when you have questions regarding this program and how to apply. Up to now 20 STSMs have been awarded with this grant. For the coming grant period again STSM grants are available. Please take note when the announcement is made.

## ITC Conference Grants

By the ITC Conference Grants Coordinator (Marta Goliszek, UMCS, PL, [marta.goliszek@poczta.umcs.lublin.pl](mailto:marta.goliszek@poczta.umcs.lublin.pl))

Inclusiveness Target Countries (ITC) Conference Grants aim at supporting PhD students and ECI researchers from participating ITCs, to attend international (preferably European) conferences related to the objectives of our Action, with a poster or oral presentation. Two ITC conference grants have been awarded up to now and more grants will be available in the coming periods.

\* The following countries are considered as ITC: Bosnia-Herzegovina, Bulgaria, Cyprus, Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Luxembourg, Malta, Montenegro, Poland, Portugal, Romania, Slovenia, Slovakia, fYR Macedonia, Republic of Serbia and Turkey.



*LignoCOST outreach to academia, industry and public*

## Quote of a STSM applicant:

*“Through LignoCOST I got the chance to work together with lignin experts from a host institution with complementary expertise on lignin.”*

## Joint paper by groups in Poland and Sweden:

*“The impact of lignin addition on the properties of hybrid microspheres based on trimethoxyvinylsilane and divinylbenzene”, European Polymer Journal 120 (2019) 109200, <https://doi.org/10.1016/j.eurpolymj.2019.08.027>.*

## Organised events

Kick off and 1<sup>st</sup> MC meeting, October 4<sup>th</sup> 2018, Brussels (B)

Exchange meeting LigniVAL and LignoCOST, January 14-15, 2019, Cordoba (ES)

Co-located working groups + 2<sup>nd</sup> MC meeting, March 13-15, 2019, Wageningen (NL)

Co-located working groups + 3<sup>rd</sup> MC meeting, November 13-14, 2019, Régua (P)

## General Information

For more information please consult our website

[www.lignocost.eu](http://www.lignocost.eu)

**Social media:**

Facebook > <https://www.facebook.com/lignocost/>

LinkedIn > <https://www.linkedin.com/company/lignocost>

Twitter > <https://twitter.com/lignocost>

Persons interesting in lignin valorisation, please contact us to join this International pan-European network.

CA17128 LignoCOST is a networking Action, supported by COST, to stimulate and financially contribute to the organisation of short term scientific missions between partner institutions, networking events, workshops, and training schools. No support is available to perform research & development activities.

## Coming networking activities

In Grant Period 3 we will organise the following activities:

- Workshop 'Current status of lignin valorisation in Europe' in Stockholm (SE), October 12, 2020
- Training school
- STSMs
- Co-located working groups + 4<sup>th</sup> MC meeting
- <https://greeniupac2020.org/workshops/>



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## COST description

COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.

[www.cost.eu](http://www.cost.eu)



Funded by the Horizon 2020 Framework Programme of the European Union