Greece – China Call for Proposals for Joint RT&D Projects launched under the auspices of the **Ministry of Science and Technology (MOST)** of the People's Republic of China and the Ministry of Development & Investments / **General Secretariat of Research and Technology (GSRT)** of the Hellenic Republic.

Greece: Funded under European Regional Development Fund (ERDF) and National Resources (GSRT)

China: Funded under Ministry of Science and Technology of the People's Republic of China

Project Title	**Integrated management and exploitation of multi-dispersed agricultural residues – application to energy production - SYNAGRON**
Project Partners (Greece) 1. University of Patras, **UP** 2. University of Western Macedonia, **UOWM** 3. Sirmet S.A., **SIRMET** **Other Collaborating Organizations** - Khalifa University of Science and Technology, **KUST**	**Project Partners (China)** 1. Beijing University of Chemical Technology, **BUCT** 2. Beijing United Pioneer Environmental Engineering Co. Ltd, **BUPEE** 3. Nanjing Benran Environmental Technology Co. Ltd, **BENRAN**

MINUTES OF THE 2nd PARTNERS' MEETING

The 2nd partners' meeting of the project SYNAGRON took place via zoom teleconference on Thursday, **16th July 2020**, 16:00-20:00 Beijing time (11:00-15:00 Greece time).

Participants:

1. Prof. Vagelis G. Papadakis, University of Patras, Greece (Coordinator of Greek Consortium)
2. Assoc. Prof. Wen Wang, Beijing University of Chemical Technology, PR China (Coordinator of Chinese Consortium)
3. Prof. Michael Kornaros, University of Patras, Greece
4. Mrs. Vasia Aravani, PhD Candidate, University of Patras, Greece
5. Dr. Ziyi Yang, Beijing University of Chemical Technology, PR China
6. Mrs. Hangyu Sun, Beijing University of Chemical Technology, PR China
7. Mr. Liu Haopeng, Beijing University of Chemical Technology, PR China
8. Prof. Maria Goula, University of Western Macedonia, Greece
9. Assoc. Prof. Savvas Douvartzides, University of Western Macedonia, Greece
10. Dr. Nikolaos Charisiou, University of Western Macedonia, Greece
11. Mr. Anastasios Tsiotsias, PhD Candidate, University of Western Macedonia, Greece

12. Mr. Georgios Efthimeros, Sirmet S.A., Greece
13. Mrs. Kalliroi Kyriou, Sirmet S.A., Greece

The meeting was coordinated by Prof. Papadakis and started by introduction of each participant and giving general information about the current state of project SYNAGRON. It was emphasized that the project has covered about 1/3 of its total duration, thus a good review and further organization of the work is necessary for the overall success of the project. The presentations and discussions have as follows:

Presentations & Discussions:

Vagelis G. Papadakis, UP *"The project SYNAGRON: Objectives, progress, planning"*

Vasiliki Aravani, UP *"T1.1: Survey of the most promising agricultural residues & WP1 progress – Greek side"*

Wen Wang, BUCT, *"Overall progress and planning- Chinese side"*

Hangyu Sun, BUCT, *"T1.1: Survey of the most promising agricultural residues & WP1 progress – Chinese side"*

Discussion on WP1

Michael Kornaros, UP *"T2.1: Experimental investigation of the anaerobic digestion process using various biodegradable agricultural residues & WP2 progress & planning"*

Wen Wang, BUCT, *"Overall progress of WP2 and WP3 – Chinese side"*

Ziyi Yang, BUCT, *"WP2: Mitigation of ammonia inhibition in AD process"*

Discussion on WP2

Short break

Maria A. Goula, UOWM *"Overall progress of WP3 and WP4 – Greek side"*

Savvas Douvartzides, UOWM *"T3.2: An overview on catalytic pyrolysis for the production of bio-char, bio-oil and syngas"*

Anastasios Tsiotsias, UOWM *"T3.1: Catalysts' development for the catalytic pyrolysis of lignocellulosic biomass"*

Discussion on WP3

George Efthimeros, SIRMET *"Contribution of SIRMET in WPs & Tasks of the project"*

Wen Wang, BUCT, *"Contribution of* BUPEE and BENRAN *in WPs & Tasks of the project"*

Vagelis G. Papadakis, UP *"Project communication & dissemination"*

General Discussion – Next steps

Meeting Closure

All the above presentations are attached in the present minutes as Appendixes. There, the progress per Task and WP is presented in detail by each participating partner. When the presentations dedicated to each WP were completed, a thorough discussion took place in order to elucidate various technical issues and more importantly to identify points for cooperation among Greek and Chinese partners.

Discussion – Conclusions for WP1:

WP1- MARKET UPTAKE, M1-M18 [GR: UP (Lead), SIRMET, UOWM / CN: BUCT (Lead)]

WP1 includes a detailed survey of the most promising agricultural residues and an economic analysis for the outcomes expected by the introduction of each final product of the processing plant into the energy market. Both studies specify the economic parameters and the commercialization prospects from the utilization of the proposed technologies in regional and national level, in both China and Greece.

T1.1. Survey of the most promising agricultural residues (GR: UP, SIRMET, UOWM / CN: BUCT)
T1.2. Market analysis for bio-char, bio-oil, biogas and hydrogen (GR: UP, SIRMET / CN: BUCT)

D1.1: Report on the most promising agro residues in CN & GR (M18)
D1.2: Report on market analysis in the two countries (M18).

UP has the leadership to perform this WP and has been agreed that BUCT will provide to the Greek partners all necessary information/data regarding the most promising agro residues in China as well as Chinese market data for the envisaged products (bio-char, bio-oil, biogas and hydrogen).

Deliverable D1.1 has already been completed for both countries, and full draft reports were submitted to all partners. A common publication will be prepared. Deliverable D1.2 is ongoing, and it is expected to deliver by the end of year.

Discussion – Conclusions for WP2:

WP2- BIODEGRADABLE WASTE FERMENTATION FOR BIOGAS PRODUCTION, M1-M24 [GR: UP (Lead), SIRMET, UOWM / BUCT (Lead), BUPEE, BENRAN]

WP2 concerns the detailed experimental investigation and the theoretical modeling and optimization of the anaerobic digestion (AD) and solid/liquid separation processes. Experiments provide insights on the parameters of operation and control which influence the performance of the relative equipment depending on the selected feedstock and its properties. Results are used on the experimental optimization of the individual processes and validate the subsequent theoretical modeling. The theoretical models are formulated to rationally explain the observed processing phenomena as well as to widen the spectrum of the parametric analysis of the reactors and the auxiliary equipment.

T2.1. Experimental investigation of the anaerobic digestion process using various biodegradable agricultural residues (GR: UP, SIRMET / CN: BUCT, BUPEE, BENRAN)
T2.2. Theoretical modeling and optimization of the anaerobic digestion processes using various biodegradable agricultural residues (GR: UP, UOWM / CN: BUCT)

D2.1 Mid-term project report (M18)
D2.2 Report on the experimental investigation of AD processes (M20)
D2.3 Report on the theoretical modeling and optimization of the AD processes (M24)
D2.4 Dissem Activ: 2 public in Int journals, 2 participations in Int confer (M24).

Both research teams have started their investigations on testing and using the appropriate mixes for anaerobic digestion experiments. The seasonal and spatial distribution are taken into consideration for the mix design. The majority of the results is expected by the end of the year. The possibility to produce common publications was discussed in detail.

Discussion – Conclusions for WP3:

WP3- NON-BIODEGRADABLE WASTE CATALYTIC PYROLYSIS FOR THE PRODUCTION OF BIO-CHAR, BIO-OIL AND SYNGAS, M1-M24 [GR: UOWM (Lead), UP, KUST / BUCT (Lead), BUPEE, BENRAN]

WP3 concerns the detailed experimental investigation, theoretical modeling and optimization of the catalytic pyrolysis process. *Design and development of innovative catalytic systems are performed in order to improve the quality and/or the quantity of the produced bio-oil and chemicals. Efforts would be directed towards exploring the prospects of various catalysts from zeolites, as alkali ion-exchange zeolites, alkali ion-loaded zeolites and supported alkali metals, as alkaline metals on alumina or silica, alkali metals and alkaline metal hydroxides on alumina.* Experiments provide insights on the parameters of operation and control that influence the behavior of the respective equipment depending on the selected feedstock and its properties. Results are used on the experimental optimization of the specific process and validate the subsequent theoretical model, which allow the rational explanation of the observed reaction mechanisms. Modeling results are validated by the accompanying experiments and optimization conditions are recognized depending on the feedstock type and user needs for biogas, bio-char, bio-oil or uncondensed gases.

T3.1. Experimental investigation of the catalytic pyrolysis process using various non-biodegradable agricultural residues (GR: UOWM, KUST / CN: BUCT, BUPEE, BENRAN)
T3.2. Theoretical modeling and optimization of the catalytic pyrolysis processes using various non-biodegradable agricultural residues (GR: UOWM, UP)

D3.1: Report on the experimental investigation of the catalytic pyrolysis process (M20)
D3.2: Report on the theoretical modeling and optimization of the catalytic pyrolysis processes (M24)
D3.3: Dissem Activ: 2 public in Int journals, 2 participations in Int confer (M24).

UOWM is preparing all necessary catalysts and substrates that will provide BUCT for the Chinese partners to perform the catalytic pyrolysis experiments. The first shipment of catalysts is expected by the end of August 2020. BUCT agreed to perform the necessary experimental work and provide UOWM with the information needed for T3.2, i.e., the Theoretical modeling and optimization of the catalytic pyrolysis processes. The possibility to produce common publications was discussed in detail.

Dr. Efthimeros from SIRMET SA and Prof. Wen Wang, on behalf of the Chinese companies, presented how the participating companies will contribute in project implementation and their specific involvement per task and WP.

Prof. Papadakis presented the necessary dissemination and communication actions that must be undertaken in the next months (website, newsletters, stakeholder groups, information days, etc.) and how they are allocated per partner and country.

Finally, it was agreed that the 3rd tele-meeting will be organized November of 2020 among all participants.