



Worldwide Intercluster Initiative for New Materials and Processes focused on Clean Technologies

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DELIVERABLE REPORT

Wiintech mission to the USA

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Executive summary

This report intends to summarize the visit of the consortium to the USA, one of the four selected countries in the WIINTECH project. While this trip, the group has participated in a variety of fruitful meetings along with companies and potential cluster partners. This trip has allowed us to measure the potential of the clean sector in the US at a political, technological and market levels. The visits and presentations were primarily concentrated in 2 main states:

- Ohio
- Mississippi

This report will not only give an overview of the meetings and company visits but also give a perspective for the future of the WIINTECH project in the USA.

A. Deliverable report

1. Overview of the clean tech market in Ohio

The meetings have been prepared thanks to the assistance of Ubifrance, as a coordinator of the agenda. The existing relationships between Plastipolis and Polymer Ohio have also helped speed up the process of getting into the right contact and optimize the visits and networking activities in Ohio. The objectives of the visits and presentations were to get an overview of the clean tech market in Ohio and to study the opportunity to sign an MOU with the identified cluster: Polymer Ohio.

1.1. Key figures

The state of Ohio totals a number of 2,400 polymer companies and 130,000 employees. Ohio plastics industry ranks 2nd in the country in terms of the number of employees. The Akron University in Ohio also ranks in the top 5 universities for polymers in the USA. Ohio has capitalized on its traditional Polymer Supply Chain industry to build a new Bio-economy industry. What is most striking in that sense is the level of involvement and collaboration of all the actors of the economy. The initiative of the Ohio Bioproducts Innovation Center (OBIC) is particularly relevant as they encourage cross cutting innovation between agriculture and polymer processing activities (from feedstocks to market, from Cell to Sell). The varieties of initiatives and interests for the Wiintech group are summarized below.

1.2. Visits of local companies

The group had the opportunity to meet with renowned companies in the plastics industry. They introduced their sustainability programs to us, showing up the opportunities for positioning foreign technologies.

Procter and Gamble company

The Wiintech group was welcomed by Woodrow Keown, Director Global Sustainability at P&G. He introduced us to the long term environmental sustainability vision of the company.

They have 2 main programs:

- Environmental sustainability
- Social responsibility

Their ambition is to replace 25% of petroleum based products by 2020. In order to reach this goal and to lower the carbon footprint of their products, they put their efforts on raw materials and design (packaging...). They want to address 75% of their customers who are “eco-aware” but will not accept trade-offs in cost and performance. Some 45 plants are zero waste. In addition, they see low cost energy in the US as a significant benefit but are realistic and do not think it will last indefinitely.

The main interest of this meeting for the Wiintech group is that they have phrased their needs in terms of clean technologies (Access to low cost biomass feedstocks, access to technologies for converting biomass to sugars....). They have worked on a “non confidential” technical needs list that they will be able to share with the group.

This also shows that large groups like P&G are environmentally conscious.

Emery Oleochemicals

The group had then a very interesting meeting with Emery Oleochemicals, a natural-based chemicals provider, turnover \$1.3bn owned by Malaysian and Thai interests. We were welcomed by Mark Durcholz, director of business development and Dave Couchot, site operations director. They introduced to us their sustainable development approach, based especially on an extension project of their site with the creation of an esterification unit and a substantial scale polyurethane recycling unit. They are particularly interested in green polyols at a competitive price. As they plan on attending the K Fair in Düsseldorf in October 2013, this is an opportunity to do the matchmaking with targeted members of our individual clusters.

1.3. Meetings with local governments and associations

Apart from companies, the initiatives lead in the clean tech field are also noticeable at a municipality level and among associations and universities.

City of Cincinnati

Larry Falkin, director of the city of Cincinnati's office of environmental quality introduced the city's initiatives in terms of clean technologies.

The Cincinnati's office of environmental quality leads the "Green Cincinnati Plan". The mayor has also signed the "climate change protection agreement". The city of Cincinnati is involved in a variety of initiatives to answer climate changes, especially:

- Solar energy
- Biomass : 5 anaerobic digesters in Ohio
- Public transportation : level 2 electric charging stations for hybrid vehicles; feasibility study for shared bike kiosks
- Waste management : curb recycling program with 70% of household volunteers; recycling facility about to open in November 2013
- Water : ordinance passed for the collection and reuse of rainfall water

Larry points out that sustainable development in the US is lead by **"business opportunities"**. **But we clearly see that mindsets are changing in Ohio and that this change can be impulsed at political level by municipalities and local governments. It was stated that Cities are more committed to a green agenda than state or federal government.**

Therefore, this exchange sounds very positive to the Wiintech group as municipalities refer to different suppliers of technologies before making their final choices. There are and will be "bid opportunities" where our clusters can position high end technologies coming from Europe.

European American Chamber of commerce of Cincinnati

Anne Cappel, the executive director of the EACC made a presentation of the chamber's initiatives in order to encourage business development activities and partnerships between Europe and the USA. Anne was really motivated by the Wiintech project, especially as she serves as a gateway for the US market, like the Wiintech consortium does for Europe. There was interest and opportunities for green chemistry and polymer recycle amongst companies present.

Antec conference

The group made a tour at the Antec fair, annual technical conference and exhibition for plastics, organized by SPE, the largest association for plastics manufacturers and related industries in the USA. We were welcomed by Willem de Vos, CEO of SPE who presented the association and introduced us to several companies in the exhibition hall (about 100 exhibitors represented). The clean tech side of the conference is also to be mentioned as several technical conferences were related to sustainable development like: bioplastics, plastics environmental...

Polymer Ohio



Meeting with Joe Jacomet from Polymer Ohio in Columbus on April 23rd 2013

Polymer Ohio is an association based out of Columbus, OH, managed by Wayne Earley, CEO. We received a presentation from Joe Jacomet, general manager. PolymerOhio's goal is to make Ohio companies more competitive and enable them to grow faster. This comes from understanding their needs and connecting them to others who can help. What are the opportunities for Wiintech to partner with an Ohio polymer organization?

- 74 members located in Ohio: academia, consulting, industry, research laboratories and non for profit organizations.
- Very professional, fast growing organization
- Long term relationships with European based partners

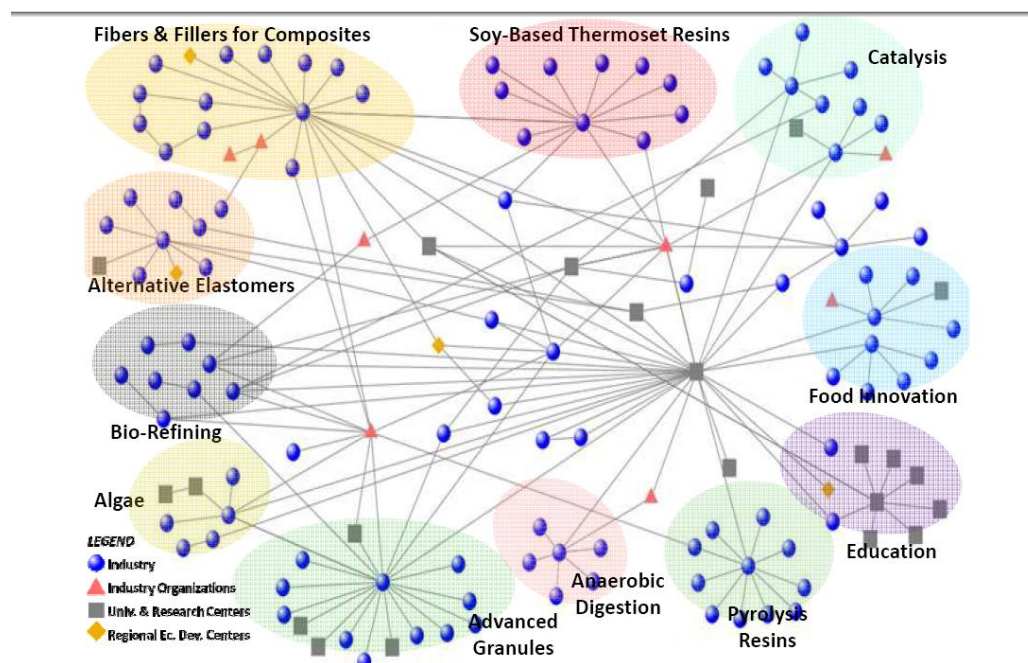
Polymer Ohio is well known and trusted in Ohio by local companies, research centers and universities. They act like European clusters, as a "catalyst" for innovation. They could certainly serve as a good entry point for all the relevant contacts in Ohio and we could implement pilot actions along with them.

1.4. Meetings with research centers

Ohio Bioproducts Innovation Centre OBIC

The OBIC center was created by the Ohio State University, especially the College of Food, agricultural and environmental sciences. The cluster drivers are the feedstocks, technologies and markets as per the graph below linking the industry organizations, university and research centres and the Regional economic development centers.

Bio-economy model in Ohio



The group was particularly impressed with the visit of the PENRA rubber pilot plant, using Russian dandelion to develop entirely natural rubber. Indeed, the USA currently imports 100% of their natural rubber, which could be supplied by the domestic market. The US sees natural rubber entering a critical shortage period as it is essential in key defence and aerospace applications. We also visited the algae ponds of BioHio Research Park in Wooster, OH. Algae are seen as biofuel but also added value chemical raw materials.

Among other relevant initiatives in clean technologies, we can quote the Team Gemini project, set up thanks to a call issued by SWACO, the Solid Waste Authority of Central Ohio. The objective of the project is to design, develop and manage a Material recovery facility. The facility will receive about 1 million tons of residential and commercial mixed waste. The synergy model will consist in receiving waste stream to be recycled and transformed into by-products to then generate energy. The potential is huge as Ohio generates a total of 8 to 9 million tons of waste every year.

Battelle

Battelle is a non profit global R&D organization. Their mission is to apply science and technology to real world problems. They generate \$60 billion annually that they re-invest. They have 130 locations worldwide and 20,000 employees. They have a specific department for Energy and Environment, working for example on bioproducts like soybean. They already work with counterparts in Europe and have offices in Geneva and subsidiaries in the UK.

One opportunity to collaborate with the Wiintech group would be at the occasion of European projects where international partners are required. Also, European applied research universities could be positioned at Battelle on specific topics.

1.5. *Debriefing and outputs*

The first impression given by the Wiintech group was very positive. We received good feedbacks from the various contacts:

- Anne Cappel from the European-American Chamber of Commerce stated that our Wiintech presentation was very clear, “straight to the point” and represented a good “gateway” to European partnerships
- Emery Oleochemicals insisted that it was the first time they saw a group of sectors coming to them with complementary technologies presented a “A SOLUTION”

Coming as a group representing several European countries and a critical mass of more than 2,000 companies and 300 R&D centers certainly helps to save time and address immediately the top level entry in the companies, universities and research labs we meet with.

On the other hand, the technological level reached by the universities, research labs and companies we have met with can make it difficult to find possible ways of collaboration, given their capability and the competition between them and EU companies. Also, we felt a strong will to defend the US domestic market and to “buy American”, especially at an association and community levels, where they protect their interests of their own industries. On the contrary, the welcome we have received from the companies was very encouraging as they did not hesitate in sharing with us their technological needs and interests. At E.U level, there could be more European projects involving international partners as this could help with implementing technology transfer partnerships and do the follow up on the contacts we have already initiated.

2. Overview of the clean tech market in Mississippi

The meetings in Mississippi were organized thanks to the strong commitment of the Mississippi Polymer Institute. We benefited from a very dense and complete program from April 24th through April 26th. It started with a formal dinner on Wednesday, April 24th, gathering people from the industry and the political side. We then had a mini trade show organized on April 25th with B to B individual meetings and university research work presentations. This agenda was followed by company visits on Friday, April 26th 2013.

2.1. *Meetings with local companies*

A mini trade show was organized on the USM site, gathering 11 companies, among which big players like General Electric Aviation: Innovate, MS Power, GE aviation, Stion, Hybrid Plastics, I2R, Durasip, Eagle Green, Elevance Renewable Sciences, Reactive Surfaces and New Biomass Energy.

This trade show was the occasion to show cases the level of technological development and the orientations of Mississippi regarding clean technologies. As examples, we can quote :

- Reactive surfaces: start up located at the Accelerator that has developed biobased materials with self cleaning enzymes incorporated into a paint/coating
- Elevance: bio-refinery using any vegetable oil to convert it into specialty chemicals

- Stion: manufacturer of thin film solar panels
- New Biomass energy: torrefied wood pellets (these were mainly being shipped to Europe) & Anaerobic Digestion of dry wastes

These meetings have allowed the group to better understand the possible ways of collaboration between European and Mississippi based research labs and companies.

This vision was completed by the very interesting discussions we had with MPI and the local government representatives.



Presentation of the Wiintech group during the mini trade show on April 25th



Visit of GE aviation brand new Ellisville plant, Mississippi on Friday, April 26th 2013

2.2. Meetings with local governments and associations

Presentation of MPI

The Mississippi Polymer Institute (MPI) was established in 1993 with a goal of growing high-tech polymer and polymer-related industries in the state.

Serving as the industrial outreach arm of the School of Polymers and High Performance Materials at The University of Southern Mississippi, MPI has played a key role in growing the state's multibillion-dollar-per-year, high-tech polymer industry, and has directly assisted in the creation of thousands of jobs.

While the primary focus is supporting growth of high-tech businesses within Mississippi, MPI performs contracted work for companies worldwide.

In that sense, MPI is really eager to develop a strong partnership with the Wiintech consortium as this is part of their international development to serve as a platform for foreign research labs and companies.

They have implemented the "Accelerator" which is a 60,000-square-foot business incubator, providing a boost to start-up companies in the Gulf South region. It started back in 2011 and now hosts more than 10 companies.

State representatives and economic development authorities

The strong participation of state representatives and officials gave us a very good impression of the overall collaborative work in Mississippi. We have been honored by the presence of **Governor Phil Bryant** during the lunch of Thursday, April 25th. Among other officials who have participated in the welcoming dinner:

- Win Ellington, field representative, senator Thad Cochran
- Steve Parham, assistant district director

The Mississippi development authority of the State of Mississippi was also represented through Aggie Sikora, senior international trade specialist.

The Area Development Partnership of Greater Hattiesburg was also strongly involved, sponsoring dinner on the 25th and represented by its president, Chad E. Newell.

2.3. Meetings with universities

University of Southern Mississippi (USM)

USM School of Polymers and High Performance materials rank among the top 5 universities in the USA for polymers. Among the specific areas of research:

- Renewable and degradable
- Glassy polymer networks
- Polymer processing

What drew our attention was in particular the research done on bio-based materials, especially:

- Emulsion Polymerization of a Vegetable Oil Macromonomer based on Soybean Oil and Evaluation of the Coating Performance
- Soy based protein adhesive (alternative to UF)
- Edible oil dispersant (Dispersant made from renewable, food-grade materials that is effective in saline environments and reduces the adhesion of hydrophobic materials to substrates)
- POSS Mediated Morphology Control in Organic Photovoltaics



U.S. Coast Guard via Getty Images

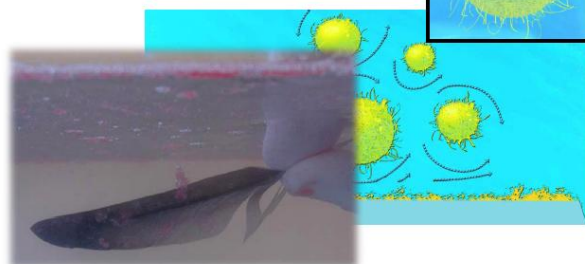
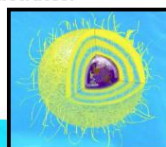


Deepwater Horizon released 210 MM gals South Louisiana light crude

Patent-Pending Edible Oil Dispersant

Lochhead, Morgan, Savin

Dispersant made from renewable, food-grade materials that is effective in saline environments and reduces the adhesion of hydrophobic materials to substrates.



The university works in close relationship with local companies. For example, the POSS usage for organic photovoltaics is being developed thanks to Hybrid plastics. USM has also put in place a Composites online masters degree that all new employees at GE aviation have to pass.

Potential partnerships with the University of Southern Mississippi can be done at a research level but also at a training level. Indeed, we met with Celine Ingram, the coordinator of the Center for International Education, who is really eager to develop students exchange programs between European based universities and schools and USM.

2.4. *Debriefing and outputs*

The visits and meetings in Mississippi proved to be of great interest for the entire Wiintech group. We really could feel the will to partner from local governments and organizations and particularly from MPI. MPI plans on attending the K Fair in Dusseldorf from October 16th to October 23rd 2013. They agree to sign an MOU with the Wiintech group at that time in order to define the future steps of our collaboration. Among the potential pilot activities we could implement are: exchange students between European and US based universities, welcome of delegations on both sides, participation in technical events both in Europe and in Mississippi to encourage technology transfer initiatives.

3. Action plan until K fair

In order to prepare our participation to the K fair in the most effective way, it is necessary to do a close follow-up of the contacts we have initiated in the USA.

To this purpose, we could break down the activities depending on the type of contacts we had during the mission trip:

- Universities
- Companies and technical or research centres
- Area development agencies and local governments

Follow-up to be done depending on the categories of contacts:

- University contacts: the possibilities of students interchange in polymer sciences will be checked with the universities we have met with, especially with Akron University, the University of Southern Mississippi and Ohio State University.
- Companies and technical or research centres: A list of 14 individual requests from US companies or labs has been generated. It will be necessary for each cluster to update it on a regular basis and to share ideas of collaborations on the sharepoint platform.
- Area development agencies and local governments: we have met with 7 area development agencies and local governments. It is important to keep them posted about our activities and developments and to introduce them to our local economic development agencies as well.

4. Overall output and conclusion

This trip to the USA was certainly very useful to the Wiintech group in order to better understand the US market and opportunities in the field of clean technologies and green materials. The great welcome and intense agenda we had both in Ohio and Mississippi have certainly encouraged us to strengthen and deepen our relationships with the selected local partners, namely PolymerOhio and Mississippi Polymer Institute. We believe the group made a very good impression, given the very positive feedbacks we have received either from local companies or local governments. We also received feedback in the media (local TV channel and press release). The group's dynamics and the support from the European Commission have certainly helped us save time and access easily the right contact in each organization. This project serves as an "accelerator" for the cluster members we all represent. We are now looking forward to "firm up" these fruitful collaborations at the occasion of the K Fair in Dusseldorf in October 2013 through the signature of a Memorandum of Understanding, setting up the basis for the first pilot actions in 2014 and beyond.

Appendices

Appendix 1: Final agenda of the mission

Appendix 2: Wiintech presentation for the USA

Appendix 3: List of partnering requests generated by face to face interaction