

# ACHEMA

## Worldwide News

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2012

# CHALLENGES OF AUTOMATION IN A GLOBAL MARKET

Automation is no purpose on its own. Measurement and control technology is an enabling technology that contributes to the increased value of companies in gaining efficient, sustainable and safe production processes.

Automation technology becomes more and more important to achieve these goals. In former times development of a new chemical substance was the key factor, then scaling up the processes, whereas today the overall efficiency of the process is the most important factor for success. Automation technology plays an important role in this environment.

But not only efficiency of the running production processes counts, overall efficiency can only be gained if plant

and workers safety can be achieved, which becomes evident due to the major plant failures and accidents in the last few years. Efficiency and plant safety therefore do not exclude each other. On the contrary, the biggest risk for overall plant efficiency is a hazardous incident in a plant, which could interrupt production for months. Plant safety has therefore absolute priority and automation technology is more and more used to limit the risk of production.

Development of new technology is required to improve efficiency. But particularly due to plant safety the introduction of the technology has to be performed carefully because chemical and pharmaceutical plants are complex systems. The technology should generate additional value (no gimmicks, no more complexity), risks should be evaluated, fields of application should be defined and the technology should have been tested under field conditions. NAMUR as a user association in the field of automation contributes to these goals by pooling the competences of users of automation technology in process industry in the installation and operation. With regard to these considerations and goals automation technology faces a number of challenges in a global environment. These challenges in my opinion are:

- more dynamic and volatile markets,
  - globalization of the market,
  - competences of people,
  - interaction between process development and automation.
- Since the economical crises in 2008/9 process industry has been facing a more and more cyclic demand. This has an implication on the design of the production units. Engineers were used to design the plant to an optimum efficiency and



■ **DR. WILHELM OTTEN**  
Chairman of NAMUR ■

***“In no other field in process industry requirements for education and training are higher.”***

yield at 100% load. Due to fluctuating demand, the plants are operating at loads from 50 to 100%. Achieving high efficiency and yield within the complete range of operation is the challenge for process and automation engineers.

Chemical and Pharmaceutical companies as well as the equipment manufacturer become more and more global. This implies increasing exchange equipment including pieces of equipment. Planning and design processes are run globally, with engineering teams working all over the world.

Quality assurance in that environment is challenging and requires more efforts compared to operation in a well established regional area.

International standards should help to promote technology and to assure a certain quality level. From a user perspective we often see that standardization is increasingly being used to build up barriers, whether around countries or the technology, in order to cement proprietary solutions.

In addition to that there is the global trend to resort to components that have an ever shorter service lifetime and do not

fit in with the long service life of our production installations. We need to keep a careful watch on the balancing act between long service life, availability and cost optimization.

Automation technology is widely used and is getting more complex. In no other

field in process industry requirements for education and training are higher. Increased training efforts have to be taken to qualify engineers and technicians in emerging countries to cope with these requirements. But not only in emerging countries we are running into problems. Demographical development in America and Europe reveals a tremendous lack of qualified people in the coming years.

Finally, further improvement of production processes can only be managed by interdisciplinary teams. Within this team a mutual understanding of the various disciplines and the overall system is absolutely necessary. Every team member has to have a basic understanding of the other discipline to speak the same language. Very often we find process engineers not familiar with the dynamic behavior and dynamic models and on the other hand automation engineers lacking process know-how. This can only be achieved by proper training at university.

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# THE MOST INTERNATIONAL

Close to half of the ACHEMA exhibitors this year were from outside Germany. Conclusion: Globalisation is not one-way traffic from Germany, but is developing into a multi-lane motorway offering unexpected opportunities.



Pictures: DECHEMA

**A** CHEMA 2012 closed its doors with numbers of exhibitors and visitors having remained stable. For five days, 167,000 participants found out about the ranges of the 3,773 exhibitors, which they presented on 136,400 square meters of exhibition area. From laboratory equipment to components, and plant-building to packaging lines, one could see products for chemistry, process technology and bio-technology requirements. For the first time, the exhibition group “Pumps, Compressors, Valves and Fittings” on its own comprised more than 1,000 exhibitors. In all fields, particular attention was devoted to the major themes of energy and bio-economics.

“We are especially happy that the new layout of the halls was so well-received,” said Dr. Thomas Scheuring, CEO of DECHEMA Ausstellungs-GmbH, at the end of the event. Hall 11, which was available for the first time, was very popular with exhibitors and visitors of the group “Instrumentation, Control and Automation Techniques”. But “Laboratory and Ana-

# ACHEMA EVER

lytical Techniques” and “Thermal” and “Mechanical Processes” also drew a strong flow of visitors. The group “Pharmaceutical, Packaging and Storage Techniques”, which now occupied the whole of Hall 3, also benefited from the new layout. With a proportion of foreign exhibitors of almost 50%, coming from a total of 56 countries, AACHEMA was also more international than ever before.

“This shows that precisely in our strongly globalised industries AACHEMA is and will continue to be the leading event. Globalisation does not just mean Europeans and Americans going to Asia—increasingly, Asian exhibitors and visitors are coming to Europe,” explained Scheuring. This was also evident in the exhibitor statistics: more than 200 Chinese and more than 150 Indian companies presented their ranges. But numerous European and US companies once again also used the opportunity to present their innovations at the exhibition, which takes place every three years.

The high international share of visitors was not only noticed by the exhibitors, but is reflected by the statistics as well: More than 26% of the visitors came from abroad, among these 11% from America and almost 26% from other non-European countries. Representatives from the chemical industry accounted for 41% of the visitors, the dominant profession being engineers. Medical technology and pharma was also strongly represented with more than 10% of all visitors. Overall, AACHEMA's attraction extended to a

large range of industries; the offerings drew not only experts from the manufacturing industries, but also from energy and utilities, electronics, and logistics. Decision-makers from middle and top management accounted once more for 30% of all visitors.

## Platform for All Kinds of Companies

In accordance with the broad range of exhibitors and visitors, the interest in all exhibition groups was high. The interest in the group “Pumps, compressors and valves” even increased compared to 2009—this emphasizes the importance of AACHEMA as the world's largest exhibition in this area.

Visitors' statistics also reflect the role of AACHEMA as a joint platform for small and medium-sized enterprises and large companies: 26% of all visitors work in companies with more than 5,000 employees and 42% in SMEs.

The exhibitors were satisfied with the response. “AACHEMA's influence is undiminished,” said Dr. Michael Thiemann, CEO of ThyssenKrupp Uhde and President of the AACHEMA Committee, at the interim press conference on Wednesday. Other exhibitors also made positive statements about the quantity and quality of the visitors. “It was a very successful show for us; considerably better than in 2009, even better than 2006 before the crisis happened. Our three booths attracted a high number of international and professional visitors, with an increasing number

of customers from Asia,” said Friedbert Klefenz, Bosch Packaging Technology, in summary.

Karsten Just of Bartec took a similar view: “More noticeable than the numbers is the fact that the quality of the visitors was very high.” According to the results of the visitor survey, more than 83% of the visitors in turn judged the quality of the AACHEMA as “good” or “very good”.

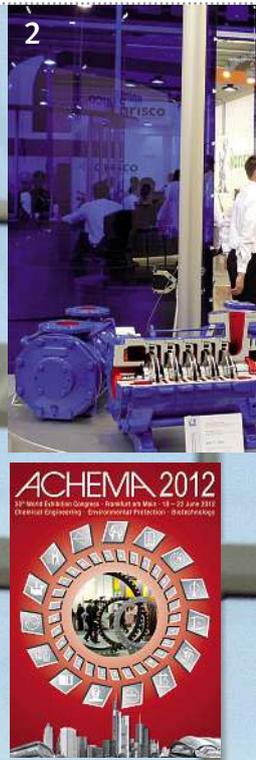
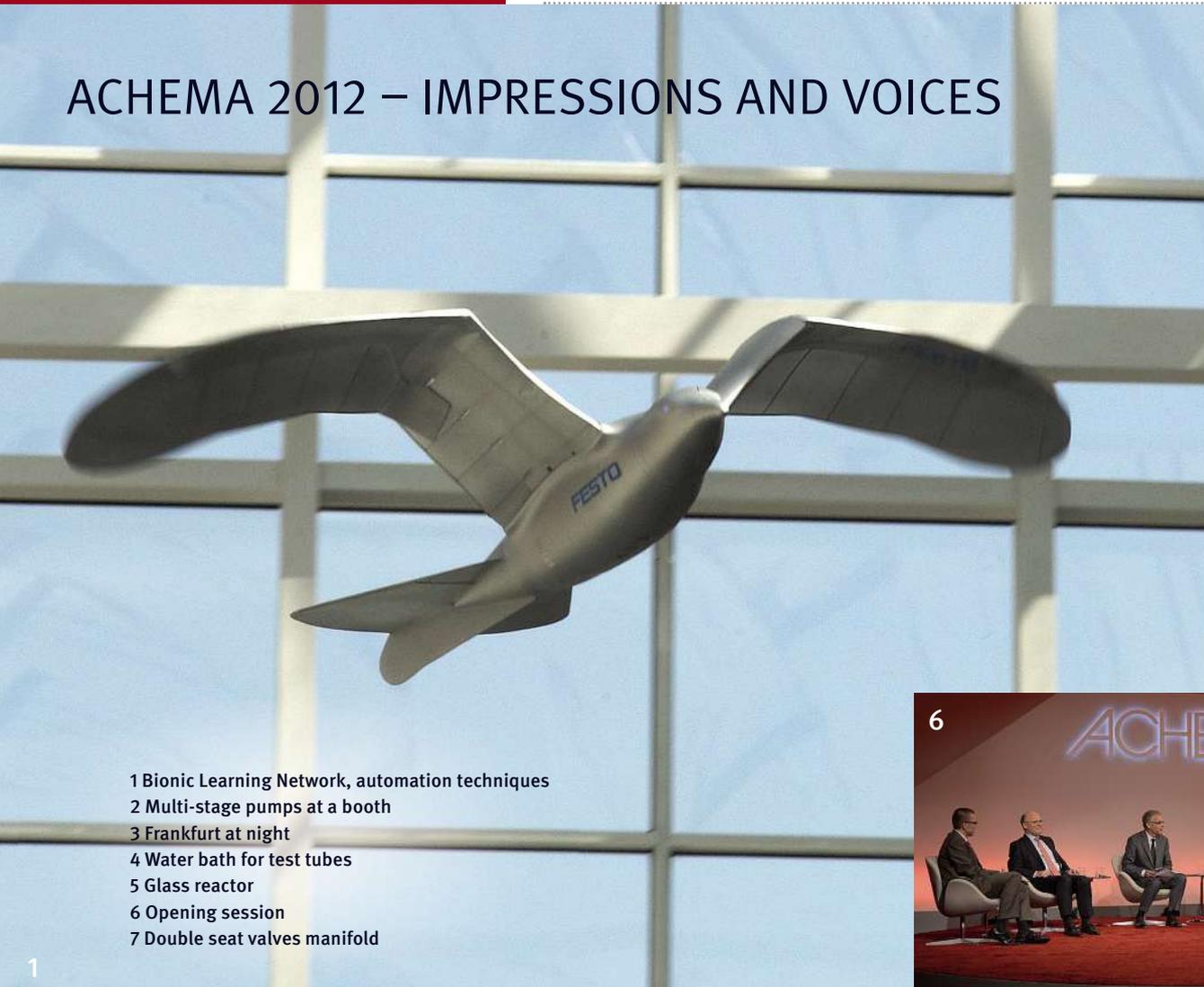
The congress, with 900 talks and numerous guest and partner events gave a look at the subjects that will be occupying the industry in the short and medium term future. The front runners among these included talks on energy generation and storage and on biomass processing. But series of talks on materials science, bionics and chemistry parks also met with a great response.

“We made the right selection of focus topics,” said Prof. Dr. Kurt Wagemann, Executive Director of DECHEMA. “The sustainable use of energy and raw materials is a central issue for the chemical industry that comes very close to the start of the value-added chain and thereby acts as a source of impetus for other industries.”

The AACHEMA community is now looking to China, where the 9th AchemAsia will be taking place from 13th–16th May 2013 in Beijing (see page 18). Then, from the 15th June 2015 it will once again be time for the heart of the process industry to beat at AACHEMA in Frankfurt for a week. ■

## World summit for used technology in 2013

# ACHEMA 2012 – IMPRESSIONS AND VOICES



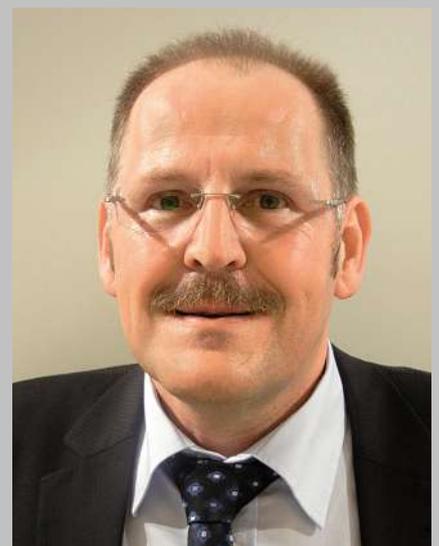
- 1 Bionic Learning Network, automation techniques
- 2 Multi-stage pumps at a booth
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**Karsten Just, Chief Marketing Office, Bartec Holding:**  
 “The first day was weak — more so than in 2009 — but Tuesday and Wednesday were much better. More noticeable than the numbers is the fact that the quality of the visitors was very high. People had clearly done their research. We had more visitors from abroad than from Germany, which is great.”



**Sean Donnelly, Vice President Xylem Analytics Germany:** “We are already for the 21st time at ACHEMA and happy that the international importance is still very high. Our first exhibition appearance as Xylem arises the opportunity to showcase our comprehensive portfolio of products to a wide range of visitors.”



**Dr.-Ing. Manfred Pertler, Sales & Marketing Director QVF, De Dietrich Process Systems:** “We have had a lot of visitors and a broad range of customers from a variety of countries with interesting projects.”



**Walter Bonnett, VP of Global Marketing, PSG Pump Solutions Group, A Dover Company:** "It is always good to be a part ofACHEMA. This is the premier event, worldwide, for pumps. Not only is the volume of leads good, but also the quality."



**Bruno Tettamanti, Head of Marketing and Sales with Biazz:** "The participation atACHEMA has been very good, especially the quality of the visitors. I'm fairly confident that we will get some business directly as a result. It's great when visitors have done their homework — lots of people had put a visit to Biazz in their diaries."

# RAW MATERIAL PROCESSING IN THE SPOTLIGHT

Mineral, renewable and secondary raw material processing – current engineering challenges



Picture: Clariant

Flotation cell at ore processing plant

The primary materials industry is currently in a transformation phase following a long period of low raw material prices which extended from the mid 1980s to the middle of the 1st decade of the current century. The slump in raw material prices resulted from political upheavals following the end of the Cold War. The Western industrialized nations were able to obtain raw materials from sources that had previously been unavailable. Raw material intensive production in Eastern Europe industry also declined. In addition, raw material production commenced at many sites in the late 1970s following successful exploration projects.

Depressed prices over a period of nearly 20 years resulted in stagnation of raw material research in the non-raw material producing countries. Increased demand for raw materials since the beginning of

the millennium has given initial impetus to capacity expansion at existing sites. However, the remaining reserves are limited at some of the large deposits which are rich in ore that can readily be processed. Furthermore, recycling should be included in the raw material supply debate. Although recycling alone cannot fully meet demand in a growth segment of industry, it is an important additional source for a variety of reasons. Among other things, recycling can be viewed as “urban mining” which provides a domestic and geopolitically secure source of raw material. In addition, material concentrations in recycle often exceed that of the corresponding ore.

Raw material processing typically involves large mass flows and relatively high cost and effort. In absolute terms, small fluctuations or improvements in

quality levels can significantly improve performance (efficiency, reduced CO<sub>2</sub> emissions). As the current process engineering disciplines have a direct root in the raw material and commodities industry, there is still a large amount of common ground between the two fields of technology. From the process engineering perspective, raw material processing is a highly interconnected sequence of operations where the various steps interact.

The initial mineral processing flow consists of a multi-stage comminution and subsequent sorting and separation before the concentrate can be refined by hydrometallurgical or pyrometallurgical steps.

In general there is now a tendency for the raw materials extracted from primary sources to be more finely structured and

## Further Information

This article is an excerpt of the Position Paper “Raw Material Processing: Mineral, renewable and secondary raw material processing – current engineering challenges; A Policy document issued by the ProcessNet Technical Groups: Comminution/Classification, Interfacially Dominated Systems and Processes, and Mechanical Liquid Separation”.

The complete document which contains detailed recommendations for R&D activities is available on <http://dechema.de/en/studien-path-123211.html>

more complex, and to an increasing extent the value minerals are only present in low to very low concentrations. As a result, fine to very fine grain sizes are increasingly becoming the norm during the mineral processing stage (comminution/flotation particle size). Comminution or sorting is feasible when intermixing exists at the microscopic level. Chemical disassociation (selective or complete) is needed for intermixing at atomic levels.

Comminution, drying and separation account for a significant portion of primary energy consumption in raw material producing countries. The expansion of worldwide production and the need to handle finer particle systems will further increase energy demand. This will affect both the cost and the carbon footprint of the various processes involved. Energy-efficient process designs will have to be developed and introduced to counteract this trend.

Enhanced sustainability during exploration and mining must be accompanied by an increase in efficiency during the mineral processing phase. New and improved technology can help achieve this goal. Mineral processing automation and management strategies, which create the opportunity to match process parameters with the material parameters of the ore at any given time, offer significant potential. This type of integrated approach is termed geometallurgy.

The “Mine of the Future (MIFU)” concept introduced by a consortium of Northern European mining companies as well as companies and institutions related to the industry is such an approach. The MIFU vision is to automate mineral extraction and processing to the maximum extent possible. At underground mining sites, mineral processing as well will no longer take place above ground. Instead, it will be located underground and linked into the extraction operations.

The extraction process can be automated by replacing drilling and blasting with continuous mechanical excavation (e.g.

cutting or shearing). A continuous flow of mineral material is generated at the ore face, and the grain size is smaller due to the method of excavation used. Further processing—such as crushing, grinding, dry sorting—should take place near the point of excavation. Since all of these items involve dry processing, they could be designed as semi-mobile and/or compact operations. The assumption is that the initial wet processing step will take place above ground or at a central point underground, as water treatment and water management are both essential for the moisture removal process.

### Ore or Biomass: Similar Principles

It may come as a surprise, but many of the considerations for ore processing are also applicable for biomass. There is a pressing need for mechanical shredding and classification technologies to process solid biomass such as residue from the forestry and lumber industry. Moist biomass such as agricultural or food processing residue (manure, beet leaves, corn stover, etc.), which is not suitable for combustion, is often used as a substrate in the production of biogenic fuel gas. The production process is generally biotechnology based. Mechanical pre-processing is normally necessary to enhance the available specific surface and process yields.

Biogenic raw materials are highly complex and consist of a large number of organic compounds in varying proportions. A large percentage of them are fats, carbohydrates or secondary metabolites. Pre-processing is absolutely essential to make this varied and often non-homogeneous feedstock suitable for a diverse range of high-tech production processes. State-of-the-art raw material pre-processing can significantly enhance process efficiency and product yields.

Lignocellulosic biomass is currently used only as a source of cellulose. No further utilization is made of the other constituents. Depending on the type, the

wood or straw is composed of around 40–50% cellulose, 20–30% hemicellulose, 20–30% lignin and 2–6% other substances.

New innovative system solutions will be needed to facilitate industrial exploitation of these constituents. Integrated processing technologies will have to be developed to make quality use of the carbohydrates and also to separate out the aromatic polymers lignin and tannin for downstream utilization.

Size reduction is the first step in the processing sequence. The size reduction process must be specially designed or modified to accommodate the specific type of wood or straw. Wet or dry size reduction may be suitable. Appropriate classification and sorting processes must be provided for the particles which have highly irregular shapes. New methods for characterizing renewable raw materials are also needed, so that instrumentation can be made available to assess the particles and users are able to effectively manage the process flow on an industrial scale.

Another step in the process flow is separation/isolation of particular constituents using extraction, chromatography and filtration techniques. However in order to significantly expand the product spectrum of constituents in renewables such as lignocellulosic biomass, these steps must be followed by physical-chemical decomposition using pyrolysis or chemical decomposition using ionic fluids, hydrolysis, hydrothermal techniques or supercritical fluids or, to make things even simpler, through techniques such as the Aquasolv and Organosolv

processes followed by lignin precipitation.

**Urban Mining:**

**Promising But Challenging**

Recycling, also known as urban mining, involves the return of secondary raw materials to the economic stream. It includes the probing of secondary deposits, extraction of the useful materials and the processing that is needed to produce marketable products.

Similar to the situation with primary raw materials, economic viability becomes a problem if

- the concentrations of value materials are high but the volumes are insufficient;
- the volumes are high but the concentrations are insufficient;
- the composition is complex (bulk and trace metals);
- the material is high intermixed (e.g. composites);
- the material includes impurities and/or contaminants.

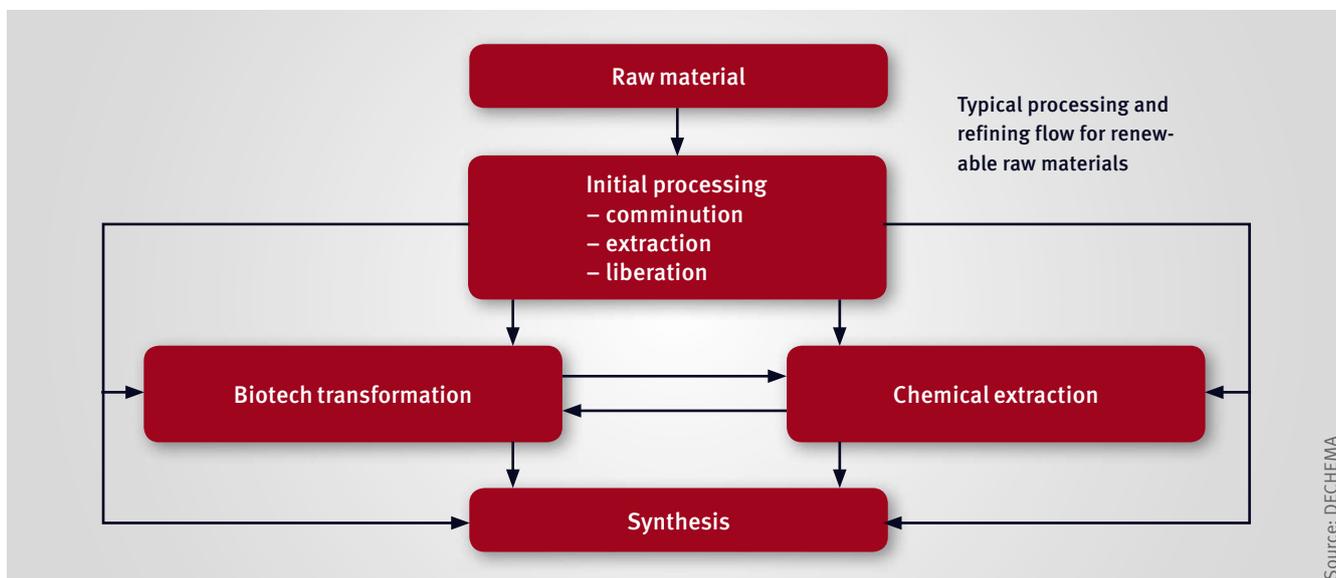
These difficulties affect not only the actual processing of recycling materials, but also the ancillary activities, namely probing, extraction (including logistics) and residue disposal.

Not only that, in contrast to the production of primary raw materials, secondary raw material recyclers are confronted with extremely stringent environmental standards.

In contrast to primary deposits, there are a number of special factors that do not apply to primary raw material extraction and processing which tend to complicate urban mining:

- the extreme diversity of complex, finely structured composite materials made of bulk metals, rare earth metals and noble metals present in coatings/alloys along with contaminants of largely unknown and constantly changing composition (advances in technology);
- the extreme diversity of particle shapes and sizes;
- extremely wide distribution requiring special collection systems and logistics;
- regional and seasonal factors which affect useful material content levels and composition;
- availability profile (quantity, composition) influenced by objective (e.g. useful life) and subjective (mobile phone hording) factors;
- strong competition for waste categories with high-value content;
- as dictated by the efficiency imperative, the extent of processing performed is limited by the current intrinsic value;
- processing must take place within boundaries set by environmental regulations (emission limits) and customer expectations (stringent quality requirements for recycling products).

Managed enrichment based on selective collection of goods that have similar composition accompanied by specially modified comminution and sorting techniques is currently the most promising approach. Product quality and recoverable material yields can be enhanced by closely matching the different material processing stages to the specific goods being handled, and this strategy also reduces the amount of effort involved in downstream metallurgical processing. ■



Source: DECHEMA

# BIOREFINERIES: GERMAN ROADMAP LEADS THE WAY

At this year's ACHEMA in June, the German "National Biorefineries Roadmap" was published. The document includes both a comprehensive overview of a range of technologies and of the paths to implementation.



Picture: Shell

Sugar cane, among others, can serve as the raw material base for sugar production (primary refining).

Replacing fossil fuels with renewable resources both for energy and for material use is a widespread vision. From today's point of view, there are some successful examples for producing chemicals and consumer products such as plastics from renewable resources, but in order for a truly bio-based economy to become a reality, the concept of biorefineries is an essential prerequisite. Biorefineries in this sense use "biomass as a diverse source of different intermediates and products (chemicals, materials, bio-energy/biofuels), whilst including the fullest possible use of all raw material

components". This is why the German federal government has asked a panel of more than 30 experts to develop a "National Biorefineries Roadmap". The following text is an excerpt of the English version of this document. The complete roadmap will shortly be published on [www.fnr.de](http://www.fnr.de).

The biorefinery process chain consists essentially of system components for the pre-treatment and preparation of biomass, as well as for the separation of biomass components (primary refining) and the subsequent conversion/processing steps (secondary refining). Biorefineries

always feature the coupling of different material and energetic utilization paths. However, practice has shown that for economic reasons, a biorefinery is generally either strongly materially-oriented or strongly energetically-oriented.

While activities to establish biorefineries have been underway in some EU member states (e.g. Germany, France, the Netherlands) for around about ten years, the topic only moved into focus at the EU level about three years ago. The contents of the integrative biorefinery projects promoted under the current 7th EUR Framework Programme are extremely varied

and for the most part encompass the development of new biorefinery processes and products, the optimization and upgrading of existing conversion processes and the industrial-scale demonstration of research results.

The term biorefinery platform refers to the intermediate products that arise during primary refining and which serve as precursor for subsequent secondary refining. A few particularly promising biorefinery paths, which differ above all in platform type as well as secondary refining type, have emerged from among the biorefinery concepts.

### **Sugar and Starch Biorefinery**

**Sugar biorefinery:** Sugar beet or sugar cane, among others, can serve as the raw material base for sugar production (primary refining). Products include table sugar, fermentation raw materials, granulated sugar as a precursor for chemical intermediate or finished products (surfactants), organic acids, vitamins, and inorganic salts. In turn, the chemical intermediates and fermentation products

(e.g. amino acids, lactic acid, citric acid, gluconic acid, and the esters and salts of these organic acids) are then either chemical intermediates or are further processed into finished products.

**Starch biorefinery:** A range of plants can serve as a raw material base for starch production, such as potatoes or cereal crops. In addition to native starch, products also include starch modifications and starch saccharification products. The resulting starch modifications (e.g. starch esters, starch ethers, dextrans) and starch mixtures are then further processed for use as thickening agents in the food industry, as an additive in paper production, or as an intermediate product in the cosmetics industry. A range of other fermentation products can also be produced and further processed.

### **Vegetable Oil Biorefinery and Algal Lipid Biorefinery**

**Vegetable oil biorefinery:** The precursors are oil seeds and fruits. Following primary refining, crude vegetable oils (fats and oils) are available as raw materials for fur-

ther processing. In addition to use as a fuel, vegetable oil is a valuable raw material for oleochemicals or for the production of biolubricants. Here, the vegetable oil can be used directly (e.g. as a solvent) or is cleaved to obtain fatty acids and glycerol. In turn, fatty acids are precursors for a whole raft of chemical products, and after processing can be found in cosmetics, surfactants, lacquers and dyes, among other products. Glycerin also has a range of applications; further processing produces pharmaceutical grade glycerin, and subsequent conversions and chemical reactions provide further chemical intermediates and products. Glycerol can also be used as a fermentation raw material. In turn, the fermentation products are either chemical intermediates or are further processed into finished products. Any incidental meal extract or press cake is generally used as an animal feedstuff.

**Algae lipid biorefinery:** The precursor for the production of algal lipids (algae oil) is microalgae. Alongside triglycerides and polar membrane lipids, the algae

crude oil contains other lipophilic algae ingredients such as carotenoids, chlorophyll and phytosterols, which can be selectively extracted and modified in secondary refining. The triglycerides can be used either in the food industry or in the technical area.

Triglycerides are also a potential raw material for the chemical industry. In the chemotechnical area, triglycerides can be used directly, or extracted fatty acids and glycerol can be extracted via cleavage. In turn, fatty acids are precursors for a whole raft of chemical products, and after processing can be found in cosmetics, surfactants, lacquers and dyes, among other products. After drying, high-protein feedstuff is produced using the deoiled algae biomass, or the algal biomass can be converted as cosubstrate into biogas through anaerobic decomposition.

### Lignocellulosic Biorefinery and Green Biorefinery

Agricultural residues and wood are the most readily available feedstock; annual and perennial grasses could also play a role. Cellulose, hemicelluloses and lignin, or mixtures thereof, are available as raw materials for further processing after completion of primary refining. There are two basis paths for secondary refining: The direct production of fermentable carbohydrates for further biotechnological conversion and the further isolated pro-

cessing of the individual fractions, as well as combinations of both pathways. Mostly cellulose and hemicellulose fractions are used in the production of fermentable carbohydrates. The enzymatic conversion into corresponding monomeric carbohydrates results in one material flow of fermentable sugars and one material flow of lignin.

**Green biorefinery:** In a green biorefinery, moist biomass in green or ensiled form, such as annual and perennial grasses, is used as a raw material. Grass juice and raw grass fibres are available as raw products following primary refining.

A green biorefinery is typically coupled with a biogas plant. This is because a part of one or both fractions is always utilized as a cosubstrate for technical/procedural reasons. The grass juice either goes directly into the biogas plant, or its ingredients are separated. The grass fibre can be directly processed into animal feedstuff, or can serve as raw material.

### Synthesis Gas Biorefinery

A specific feature of a synthesis gas biorefinery is that the individual components are not separated during primary refining; instead, all organic ingredients and components of the biomass are broken down, creating synthesis gas as raw product. The advantage of this is flexibility for product manufacturing, which can

be either fuels, methanol, higher alcohols or chemicals and even synthetics.

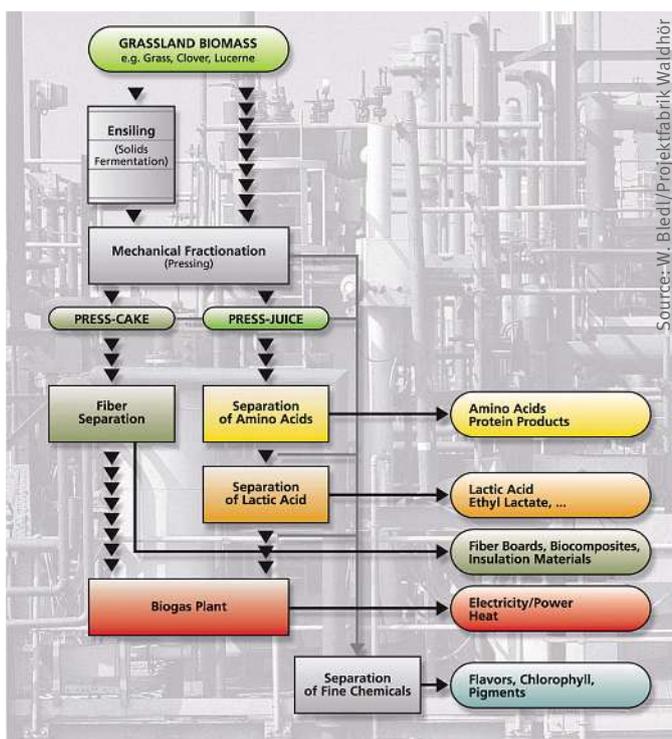
The economic and ecological classification of biorefinery concepts will play a key role, both in terms of the comparability of individual platforms with each other, and of comparability with other biomass utilization paths. While the focus on environmentally beneficial approaches is a requirement of environmental and climate protections, the economic opportunities are crucial in determining whether a concept will be developed up to a commercial system and to practical application.

In the consideration of individual platform concepts it has become apparent that, in all cases, the long-term assurance of the required biomass (whether imported or locally produced) at satisfactory prices is a decisive factor in the load-carrying capacity of the concepts. A central challenge thereby is to increase the efficient and sustainable production and provision of biogenic raw materials. Of interest thereby are new forms of land use such as short rotation plantations. It will also be crucial to develop other sources of raw materials along the lines of increases in raw material production. At the same time, the materially utilized biogenic raw material must meet sustainability requirements.

In addition, it has become evident that considerable technological advancement and innovation is necessary for the presented biorefinery concepts to be operated commercially and on an industrial scale. Both the nature and extent of the required developments may differ in detail between the concepts, but it can generally be seen that there is a comprehensive need for the integration of various process steps and sub-concepts into coherent overall concepts, as well as into product development and product refinement – key areas for the economic viability and establishment of biorefineries. A challenge for the implementation of all concepts is upscaling to industrial scale from the previous development stages.

Overall, the roadmap demonstrates that biorefineries present a promising approach for an efficient utilization of renewable resources. Biorefineries will enable not only the strengthened substitution of fossil carbon sources in the production of a range of common chemicals and energy carriers, but will also result in new products as a part of new value creation chains. ■

Functional diagram of a typical green biorefinery



# ACHEMASIA 2013 — TIME TO REGISTER!

DECHEMA was one of the first non-Chinese associations to read the signs of the times already as early as in the mid-eighties. This — back then visionary — initiative laid the foundations for AchemAsia's present success, and for her role as door opener to China's process industry.

DR. THOMAS SCHEURING

Today, China is the world's economic powerhouse, and this holds true even more so for the chemical process industries. Trustworthy forecasts indicate that China's share of the worldwide chemical market will reach the 50% mark by 2030, and there is no doubt that China is the world's hotspot for our industry already now. In parallel to this development AchemAsia has achieved the position as the international gateway to China's chemical process industry. There is no other event for our industries in China which rivals AchemAsia in terms of reputation and nationwide visibility.

In 2013 AchemAsia (May 13–16) will again stand out as the communication hub for suppliers of these industries, and as the chance to benefit from the business options that China continues to offer. This is the opportunity to strengthen your position in China, to underline your technical leadership, and to gain ground against the competition.

With the exhibitors' registration officially open since early October, bookings have started to flow in steadily, so everybody interested in exhibiting would be well advised not to hesitate too long.

These are, in a nutshell, AchemAsia's success factors:



Picture: DECHEMA

AchemAsia will again stand out as the communication hub for suppliers of the chemical process industries.

- most international—and most visible—event for China's process industry
- face-to-face communication with experts and decision makers
- partnering platform among China's heavyweights and trendsetters
- stepping stone to investment decisions
- showcase for innovations
- integrated technical solutions for all sectors of the process industries
- opportunity to recruit new personnel
- synergies through DECHEMA's global and local network

Our events are traditionally a well-balanced mix of proven features and new elements, and AchemAsia 2013 will retain this tradition. After last time's major change which was connected with the transition to the all new 'China National Convention Center'—which made up for

a big improvement—we will basically keep the proven exhibition layout. The conference part, however, is undergoing a substantial makeover as we will see a much bigger involvement of our Chinese partner associations. This time several of our Chinese partners—and one German society—will host, under the roof of AchemAsia, their own guest events in the form of independent satellite symposia. This helps to particularly address their specific target groups more directly.

## Satellite Symposia

The AchemAsia Conference will consist of the following satellite symposia:

- DVS—Industrial Forum: Joining in Chemical Apparatus and Plant Construction on May 14, 2013 (organized by DVS — German Welding Society)

T. Scheuring is CEO of DECHEMA Ausstellungs-GmbH.

- Resources for the Substitution of Petroleum: Biomass, Coal, Natural Gas (organized by CIESC Chemical Industry and Engineering Society of China)
- Environmental Protection: Upgrading of Transportation Fuels, Reduction of Air Pollution, Loss Prevention (organized by CIESC Chemical Industry and Engineering Society of China)
- Industrial Water Treatment: Rising to China's Water Challenge (organized by China Desalination Association as follow-up symposium to the CDA Conference October 2012 in Lanzhou)
- Process Analytics and Control Technology: Control is key (organized by CIS – China Instrument and Control Society)
- Product Safety: Make it safer! (organized by AICM Association of International Chemical Manufacturers)

#### Great Venue — Easy Logistics — Steady Tariff

The new China National Convention Center (CNCC) which will host the 9th AchemAsia has set standards for exhibi-

#### Further Information

The well-established AchemAsia Exhibition Profile will once again focus on national core industries:

- Chemical Apparatus and Plant Construction
- Process Technology
- Petrochemistry
- Maintenance and Quality Assurance
- Environmental Protection
- Water Treatment
- Pharmaceutical Industry
- Biotechnology
- Food Industry
- Agrochemistry
- Laboratory and Analytical Techniques
- Packaging and Storage Techniques
- Resources Development



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tion facilities in China. With its convenient and central location in the immediate vicinity of Beijing's Olympic park and its modern hall layout, combined with all the flexibility one expects from state-of-the-art fair grounds today, CNCC offers AchemAsia a perfect stage. Rental tariffs

for AchemAsia 2013 have been kept unchanged and stable, aiming at a fair and customer-friendly system with good transparency. Our graded tariff offers exhibitors various options for a wide range of budgets, based on the attractiveness of the actual booth location. ■

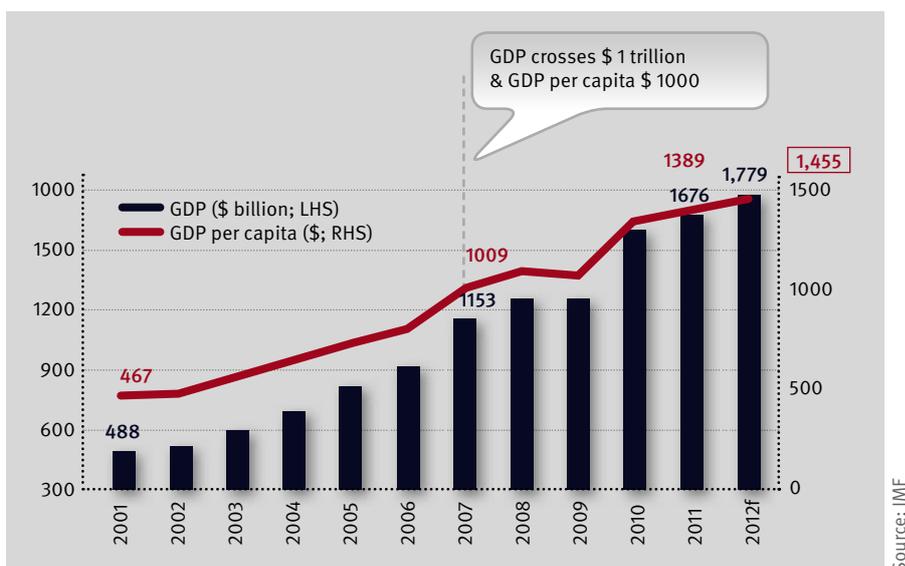
# CHEMTECH WORLD EXPO: EXPLORING NEW VISTAS

CHEMTECH Foundation will raise the curtains for 26th edition of its flagship event CHEMTECH World Expo 2013 (15th–18th January) at the Bombay Exhibition Centre, Goregaon (East), Mumbai, India.

The share of Asia Pacific market has increased significantly from 31 per cent in 1999 to 45 per cent in 2009 and India has emerged key regions on the radar of global industries. From its current share of 3% in the global chemical market, India's share is likely to increase to 6% during next five years. Outlook for the Indian chemical industry is promising and the industry is projected to grow at approx. 12% and touch USD 224 billion mark by the end of 12th Five-Year Plan in 2017. The capacity and consumption of chemicals which increased by 10 million tonnes during 11th Five Year Plan is projected to increase by 20 million tonnes during the 12th Five Year Plan. The policy has identified water, environment raw materials, and energy as key challenge areas for the chemical industry to address and is giving significant thrust on the R&D activities and innovation. Indian chemical manufacturers are realising the need to adopt modern technologies for sustainable long term growth which has necessitated the demand in the country.

CHEMTECH will bring together the entire cross-section of India's chemical and process industry including suppliers, sellers and manufacturers across chemicals, petrochemicals, pharmaceuticals, and allied industries on a common platform. The exhibition and conferences will offer great networking opportunities and exhibit state-of-the-art technologies from national and international players.

CHEMTECH will host five international conferences ChemPetro World Expo, EPC World Expo, Industry Automation & Control World Expo, WaterEX World Expo and Pharma BioTECH World Expo from 15th to 18th January for the global chemical industry to meet, network and engage to share the experiences and expertise through technology displays and conferences.



Both India's GDP and per capita income more than trebled in the last decade.

## New Initiatives

With each passing edition of the event—CHEMTECH has continued expanding horizons, exploring new vistas and taking series of initiatives to catalyse the growth of the Indian industry with the changing business environment.

CHEMTECH has launched ChemPetro World Expo as an exclusive event for the chemicals & petrochemicals manufacturers which aligns with Chemtech Core equipment manufacturers to complete the ecosystem of CHEMTECH process industry.

Further, in a bid to facilitate stronger business networks, Chemtech introduced Customized International Delegation Programme in 2011 for the participants from

various countries to provide insight into the current trends and demands of the local Indian market. CHEMTECH has furthered this initiative and launched SME Matchmaking Services recently to create synergistic partnerships between the Indian SMEs and international companies to build business partnerships. Companies can register free of cost with the platform to explore potential partnerships.

CHEMTECH World Expo 2013 will offer unparalleled opportunities to the players to experience latest technologies, understand the prevailing trends and challenges in the Indian market and connect with the leaders from the Indian and global industry. ■

## Further Information

Details are available on [www.chemtech-online.com/sme/sme.php](http://www.chemtech-online.com/sme/sme.php)

## CORROSION RESISTANCE OF STEEL AGAINST INORGANIC ACID

Steel is one of the most widely used construction materials with more than 1.3 billion tons produced each year. Buildings, industrial plants, machines, tools, pipelines, vessels and tanks are only a few of its applications in our daily life. As steels corrode in various atmospheres, in water and in soil its corrosion resistance against the four most common chemicals and inorganic acids—hydrochloric, nitric, sulfuric and phosphoric acid—as well as against mixed acids is essential and a crucial financial factor for many industries. These acids are present in nearly every industrial production process such as metal manufacturing but also explosives, food, dyes, leather, paper and fertilizers, to name

only a few. Understanding how to strengthen the corrosion resistance of steels as reaction, transport and storage devices against these omnipresent and aggressive acids is key for all industries involved. The book “Corrosion Resistance of Steel against Inorganic Acid”, edited by Michael Schütze, Thomas Ladwein, and Roman Bender, Wiley-VCH, is therefore a must-have for all mechanical, civil and chemical engineers, material scientists and chemists working with steel or acidic media.

❖ **Corrosion Resistance of Steels Against Inorganic Acids; Ed.s: M. Schütze / Th. Ladwein / R. Bender; Wiley-VCH 2012; ISBN: 978-3-527-33520-6**

## PUBLIC PRIVATE PARTNERSHIPS IN THE EUROPEAN BIOECONOMY



Public Private Partnerships will accelerate innovation and improve the competitiveness of many industrial branches in Europe. Communication and coordination are crucial for the success of these initiatives. These are two important conclusions of the “ACHEMA Manifesto on PPPs within the Bioeconomy” that recently has been published.

The ACHEMA Manifesto is the result of the two-day event “European Bioeconomy—From knowledge via demonstration to products and markets” that was held on June 20–21, 2012, in Frankfurt in connection with ACHEMA. High-ranking speakers from industry, science, politics, and research institutions

discussed in five topical sessions the current state of bioeconomy in Europe, the political framework, access to biomass, lessons learned from the market-entry of biobased products, and new funding schemes.

The final panel discussion focussed on the planned European Public Private Partnerships. The summary and conclusions of this discussion have been compiled in the “Frankfurt ACHEMA Manifesto on the PPPs within the Bioeconomy”.

❖ **The document is available for download on: [http://www.dechema.de/dechema\\_media/ACHEMA\\_Manifesto](http://www.dechema.de/dechema_media/ACHEMA_Manifesto)**

## International Events Organized by DECHEMA

- **December 6–7, 2012:** International Workshop on New and Synthetic Bioproduction Systems, Hamburg-Harburg / Germany
- **January, 22–23, 2013:** 8th Status Seminar Chemical Biology – Compound & Target Identification, Frankfurt am Main / Germany
- **January 31 – February 1, 2013:** Functional Genomics and Proteomics – Applications, Molecular Diagnostics & Personalized Medicine, Frankfurt am Main / Germany
- **February 21, 2013:** Microfluidics for Systems Biology and Bioprocess Development, Frankfurt am Main / Germany
- **April 23–24, 2013:** 2<sup>nd</sup> Workshop: The new Paradigm – IgM from bench to clinic, Frankfurt am Main / Germany
- **May 12–16, 2013:** 2<sup>nd</sup> International Conference on Materials for Energy – EnMat II, Karlsruhe / Germany
- **May 13–16, 2013:** AchemAsia 2013 – 9th International Exhibition and Conference on Chemical Engineering and Biotechnology, Beijing / PR China
- **May 21–24, 2013:** 11th Workshop on Polymer Reaction Engineering, Hamburg / Germany
- **May 27–28, 2013:** Trends in Bioanalytical Imaging – Analytics and Applications, Frankfurt am Main / Germany
- **June 3–6, 2013:** 3<sup>rd</sup> International Conference on Energy Process Engineering – Transition to Renewable Energy Systems, Frankfurt am Main / Germany
- **June 17–20, 2013:** 16<sup>th</sup> EBSA – Annual Conference of the European Biosafety Association, Basel, Switzerland
- **June 26–29:** Affinity 2013, Vienna, Austria
- **September 22–25, 2013:** 1<sup>st</sup> European Conference on Natural Products: Research and Applications, Frankfurt am Main / Germany

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