

# Sustainability: What tape companies need to know now

## Afera's 55<sup>th</sup> Annual Conference in Madrid

Hosted by the Western Europe region of Afera's Membership, represented by Steering Committee Member Laurent Derolez, this year's Conference took place in Spain's glorious capital, bringing together the self-adhesive tape industry's creative minds and decision-makers for the annual industry congress.

Combined with the customary Conference Programme of two days of lectures and activities were the biyearly meetings of the Technical, Marketing and Steering Committees (see "Activities of the Committees" for details on their current discussions and projects on pages 17-19).

### Choosing a theme

For the first time, Afera's Conference Programme Committee formed the Working Programme around the most popular theme affecting the tape industry today: Sustainability. This event served as a test project to determine if various points of view presented on a particular topic would generate a body of knowledge and discussion to be taken back for use in tape businesses. For this reason, Afera engaged a speaker such as the preeminent scientist and politician Ernst Ulrich von Weizsäcker to offer its Members the last word on eco-friendliness and business strategy.

### Overview

Hosted at the Hotel Hesperia Madrid from 2<sup>nd</sup>-5<sup>th</sup> October, 2012's Conference had a strong showing of attendees: 106 delegates and 18 partners from 12 European countries plus the U.S., Canada and Turkey.

The Annual Conference's four-day Working Programme focussed on the collaboration of Afera's Members and its three Committees and included ten lectures covering the latest trends in the tape industry. Together with an inspiring Social Programme, five-star accommodation and the backdrop of Madrid, the 55<sup>th</sup> Annual Conference was once again deemed a success.

### Feedback: venue/cuisine & 'high tech & eco-friendly' are #1

Participant input into the organisation and content of the Madrid Conference was very positive across the board. 'Hotel facilities and service' and 'quality and selection of food' were the items which received the highest scores in the participant survey conducted at the conclusion of the Conference. This suggests that Afera's annual event is one which delegates infinitely enjoy, removed from their everyday working environments and provided with the perfect environment for networking with their industry peers.

### Most popular presentation: Future state of world industry and resources because of today's environmental crises

Although all of the presentations received consistently favourable marks this year, the highest-rated paper was one which focussed on resource efficiency called "High Tech and Eco-Friendly: What Does That Mean?" by Dr. Ernst Ulrich von Weizsäcker, world-renowned authority on the environment and co-chair of the International Panel on Sustainable Resource Use (founded by UNEP) and co-president of the Club of Rome (D).

This was closely followed by "Biodegradable Films: How Sustainable Does Our Industry Want to Be?" by Ruud Wigman, market manager of labels, EMEA, Innovia Films (D), and "Corporate Social Responsibility and Sustainable Development to Drive Innovation" by Eric Pass, director of corporate strategy and new business/board member, Nitto Europe N.V. (B).

### Location & activities

The setting of the Conference, the Hotel Hesperia Madrid, provided modern, upscale meeting and conference rooms, great networking areas in the business foyer, Manzana lobby bar and restaurant, very comfortable room accommodation and great service. Its location in the Salamanca district, close to Madrid's commercial and business centre, on the Paseo de la Castellana Avenue, within easy walking distance of the best shopping streets and many cultural attractions of Madrid, made it easy to get in some extra networking and enjoy a well-rounded city trip.

Following Wednesday evening's traditional welcome cocktails, Thursday's partner tour programme included a walking tour of the Royal Palace and Austrias Quarter. In the afternoon, both delegates and partners were taken on a private tour of the Thyssen-Bornemisza Museum and enjoyed cocktails in the Plaza Mayor. Friday's partner programme offered a visit to UNESCO world heritage site Toledo. Both Thursday and Friday's programmes included tapas, cocktails and delicious, atmospheric Spanish dining.

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## Thursday's Programme

### Coatings: Acrylic monomers from biomass

After the opening of the 55<sup>th</sup> Annual Conference Working Programme by Afera President Peter Rambusch on the morning of 4 October, Houshang Kheradmand, European DCM technology awareness and innovation manager, and LCT/LCA - SD expert, at The Dow Chemical Company (F), delivered the first lecture, overviewing "Sustainable Design and the Socio-Economic and Ecological Aspects of Acrylic Monomers from Biomass (Coatings)."

#### **The best way to be sustainable is to have strong R&D**

The risks of investment, technology and the market make it easier to remain working with existing knowledge and products instead of switching to new ideas and materials. According to Dr. Kheradmand, R&D is the key driver for sustainability. The right budget and appropriate facilities create the products and services in current demand. Furthermore, the market is ready for the high-quality product. This is *the* opportunity for the tape producer. If you don't have the competitive advantage, however, don't do it.

Historically, the chemical industries have demonstrated continuous improvement and innovation, including the capability of generating high-quality products with valuable properties for society. The coatings industries have traditionally included 'green chemistry' criteria in many of its designs, processes and products.

Dr. Kheradmand dedicated part of his presentation to identifying trends and opportunities for coatings industries (regulations, resources, economic crises, market and competition) and methodologies for integrating sustainable development criteria across the product life cycle, from conception to recycling and the waste management phase. Key sustainability criteria such as economic, ecological and social status and medium-to-long-term expectations have been developed, and strong R&D organisation and innovation have been identified as the key drivers for sustainability management.

#### **Generating feedstock from biomass**

Resource limitations and demand increase due to population growth create the opportunities for other feedstock development such as monomers from biomass. But the holistic issues for these new raw materials are the competition with food, quality and performance compared to the existing products and applications. The academic scientists and chemical industries have developed the methods and technology for generating the feedstock from biomass (first, second and third generations) such as ethanol, biodiesel, ethylene, polymers and solvents.

There are no universal advantages or automatic benefits for different materials from different resources. They have their own advantages and disadvantages. Full lifecycle performance and impacts of materials must be considered to understand and to make the most informed decisions.

#### **Sustainability is profitability**

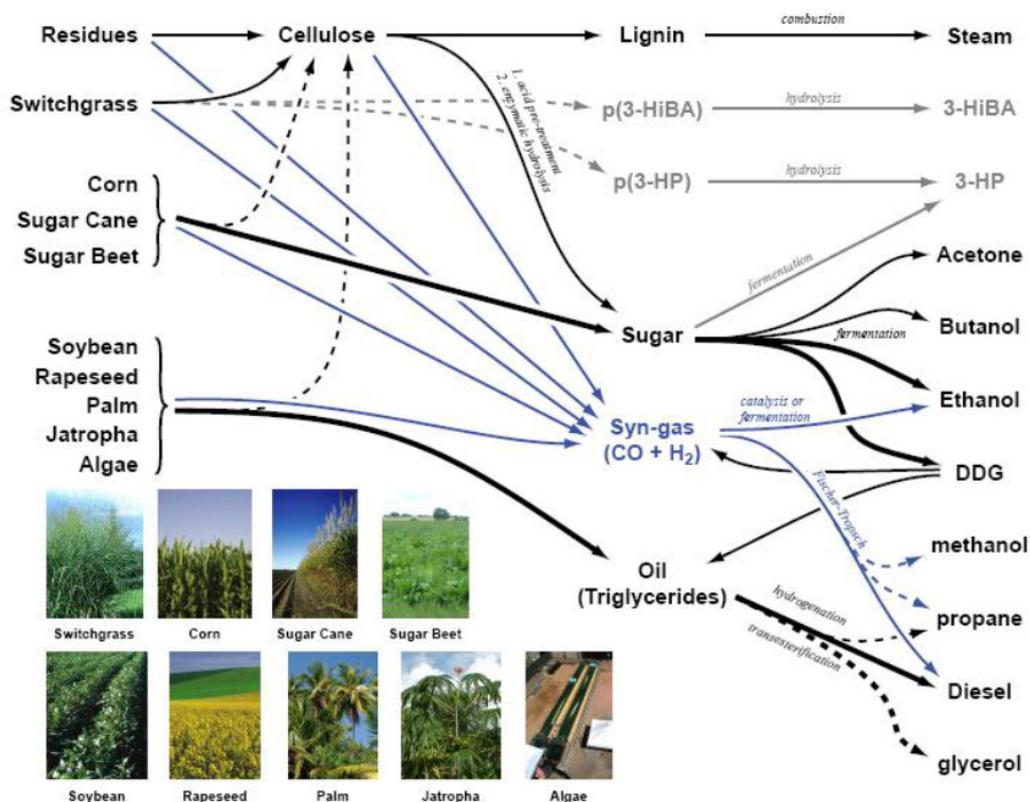
Dr. Kheradmand concluded that the growth of population, coupled with increasing consumption and limited resources, has created constraints for all industries that present challenging opportunities requiring invention and innovation. Today's economic, ecological and social megatrends have generated the need for an academic and industrial revolution in mindset.

The key business drivers of any successful company must encompass sustainable development criteria during technology and product design. Such criteria put the focus on sustainable growth: sustainable competitive advantage leading to sustainable earning power. Sustainability as a concept becomes a founding principle for continuous improvement, leading to either evolutionary or revolutionary innovations.

Using innovative materials when they are new encourages further technology development that can provide significant improvements in performance over time. Doing more with less (increasing product durability) is one of the best approaches for sustainable resources and impacts management.

Dr. Kheradmand can be reached via [hkheradmand@dow.com](mailto:hkheradmand@dow.com).

  
**Renewable Pathways to Monomer Intermediates**



## Can sustainable banking be a solution towards an upswing of the economy in Europe?

Next, Begoña Beneytez, environmental director at Banco Santander (E), delivered a presentation on integrating sustainability into Banco Santander’s business model. As mentioned in the previous lecture, sustainability strategies, when implemented in the workings of businesses, usually consist of cuing in on raising the quality of products and services through researching the customers’ desires and expectations. Current trends dictate that social and environmental elements, which are affecting the current economy, must be taken into account by successful companies.

### Supporting private and SME customers

Businesses need banks to assume more risk so that the private sector can make it through the current economic crisis. Along these lines, in Spain and the U.K., Banco Santander has helped to mitigate the impact of the current economic crisis on private customers and SMEs. In the case of the former, in Spain the Bank offers a three-year

grace period on mortgage principal repayments for customers experiencing financial problems. This is an exceptional measure, created in response to the difficult times some of Santander's customers are experiencing.

The Bank has also carried out various initiatives supporting companies, such as the Santander Grants programme, helping to generate 5,000 university-student internships in SMEs in Spain, with an investment of €9 million. In the U.K., Santander is carrying out an important programme in support of SMEs in collaboration with the government, with the aim of creating employment and generating growth. The Bank is also currently transferring its experience of facilitating micro-credits in Brazil, Chile and El Salvador to other countries where it is present, such as Mexico.

### **Integrating sustainability into every aspect of business**

For Banco Santander, 'sustainability' is the contribution of the performance of its business activity to the economic progress of communities, taking into account its impact on society and the environment and fostering stable relations with stakeholders. Commitment to sustainability means integrating ethical, social and environmental standards criteria into its management, with the primary support of top-level management. A key element of a viable sustainability programme is solid corporate governance, which ensures sustainable management and a long-term vision.

### **Investing in higher education**

Banco Santander has worked under a well-defined sustainability strategy, centred on three principal elements: investment in higher education; investment in the local communities and environments it affects; and long-term commitment to its stakeholders. Its main lines of action also include incorporating social and environmental issues into its own operations and financing activities.

In 2011, Banco Santander invested €170 million in corporate social responsibility projects, 15% more than in 2010. Santander is convinced of the decisive role played by higher education in ensuring social and economic progress. For this reason, the Bank has made its commitment to universities the main focus of its sustainability strategy.

### **Fighting climate change**

In the area of environmental protection and conservation, Santander intends to play an active role in the fight against climate change. In recent years, the Bank has introduced strict controls on its consumption of inputs and on its emissions, implemented energy efficiency measures according to its Energy Efficiency Plan (2011-2013) and set up a climate change office. Furthermore, the Bank continues to make progress on the incorporation of social and environmental criteria into its financial operations, including in its risk training in credit operations.

### **Corporate sustainability committee**

In order to integrate sustainability into its business model, Banco Santander has a sustainability committee chaired by the CEO and comprising representatives from different business and support areas, that foment and co-ordinates the various initiatives conducted in this sphere within the Group. Santander Brazil and Santander United Kingdom, both of which have excellent positioning in corporate social responsibility, also carry out important work in fostering and contributing decisively to disseminating best practices within the Group.

Questions or comments regarding Banco Santander's approach to sustainability issues can be directed to [sostenibilidad@gruposantander.com](mailto:sostenibilidad@gruposantander.com).

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## **Still using Excel or even a white board to plan your processes? Quintiq's Supply Chain Planning software increases efficiency**

After a midmorning break, the third lecture of the day was an interesting introduction into the possibilities of utilising supply chain planning (SCP) software solutions. Presenter Alfred den Besten, global marketing director of Quintiq (NL), argued that businesses today, 30-40% of which are still using Excel sheets to plan their processes, could take a step toward sustainability as a by-product of optimising their supply and total value chain processes through the use of algorithm software designed by Quintiq.

## **Save the Earth by reaping greater profits?**

The current topic of achieving 'more with less' is an interesting one. Everyone would like to deliver more in their businesses by using the same or less energy and fewer raw materials and resources. But how is this really possible? If companies optimise their supply chains, production, logistics and workforce, efficiency increases and expenses decrease. Fewer unsustainable resources are required. It follows that business actions that generate income, rather than deplete it, can lead to sustainability.

## **Why with Quintiq?**

A recognised SCP leader, Quintiq has a proven record across a wide range of industries. Extremely configurable around central planning basics, Quintiq's integrated supply chain solutions enable project management in the form of a standardised tool for system implementation. They also allow for visualisation of complex, multi-stage process routings; scenario modelling, balancing OTIF and 'best manufacturing sequence'; and reporting in the form of a comprehensive and configurable set of reports. The SCP solution can be networked, e.g., the system can be accessed and updated from multiple plants; and it is very compatible, i.e., it can interface with SAP.

Quintiq has made the challenge of balancing people, planet and profit KPIs look convincingly surmountable. Companies, after determining their KPIs, apply Quintiq's integrated SCP software, achieving a balanced, flexible optimisation through time. Primarily, this leads to waste prevention through less energy and fewer raw materials utilised, a more efficient distribution network realised and lower mileage travelled. Delivery performance increases, inventory levels decrease and, not only are profits higher, but companies work within a more environmentally minded framework.

Business cases include a company in the metals industry which has realised the decrease of a hot-hour window to a 20-minute window between products, saving the company millions. Another company in the pig slaughtering industry has become both more efficient in its production lines and directly connected to the market rates of different types of meat. The company has thus achieved zero waste and price optimisation in its processes.

## **Optimisation never ends**

Quintiq has developed algorithm software which assists companies in SCP all across the supply chain, effecting raw materials suppliers, designers, workforce, factories, distributors, transportation, delivery, retailers, consumers, etc. Through Quintiq's solutions and ever-changing KPIs, business circumstances, market conditions and other components, a truly sustainable company will never cease in optimising its supply chain and production. There is always a percentage to be won somewhere—not just in daily planning but over the long-term. Especially in the metals industry, winning 0.5% signifies a lot of money.

## **The importance of knowing your KPIs**

Establishing KPIs—business principles and progress toward strategic goals—is extremely important in the strategic planning process. Optimisation comes out of knowing what a company's true KPIs are and maintaining their balance. This can also be linked to your annual or 5-year operating plan, in which total-value-chain-related decisions have a longer-term impact.

Surprisingly, many companies work with business rules and parameters, of which 80% are outdated, blindly-accepted and/or of unknown origin. Through analysis of business logics, paired with decision-support systems (which should never be automated), automatic optimisation is achieved.

For many business, supply chain formulation is very focussed on a short-term plan (a weekly or monthly view), as their planning is all about ordering and ordering changes, i.e., factoring in disruptions in availability. Decisions are made based on financial impact. A financial analyser linked to its supply chain lets a company view the financial impact of various decisions taken that effect the overall supply chain.

## **Reduction of working capital & improving service performance**

AkzoNobel Powder Coatings have implemented Quintiq's integrated SCP solution to much success. Part of one of the three main divisions of AkzoNobel, AkzoNobel Powder Coatings produces a specialised product, just as many PSA tape companies do.

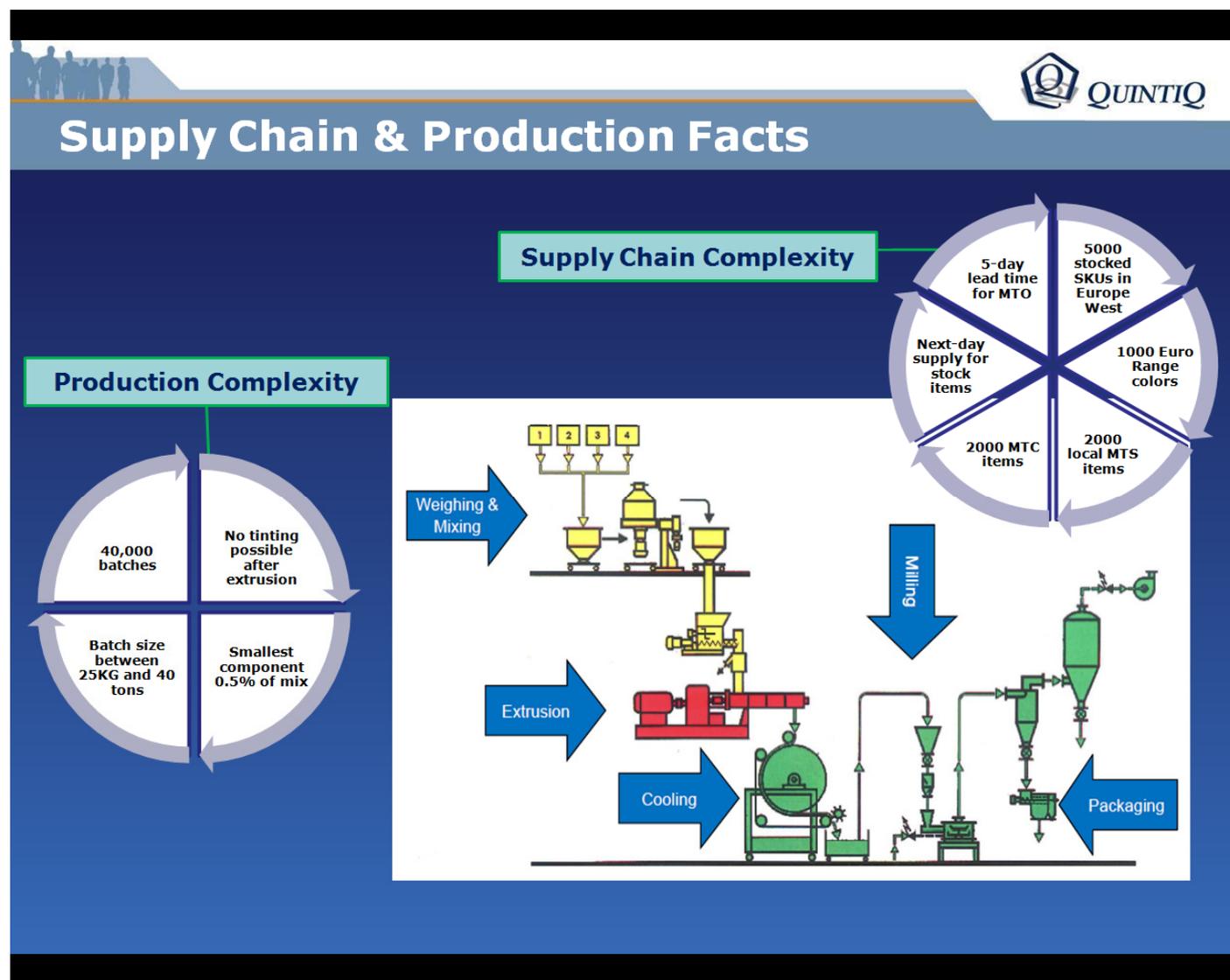
With 12 warehouses and about 8 separately functioning European plants, AkzoNobel wanted to have a fully integrated planning tool which would enable them to bring all the sites within a centralised planning environment,

including all the KPIs and business rules and constraints they wanted to factor in. Because AkzoNobel delivers made-to-order products within short timeframes, the entire supply chain, from production down to the proper delivery trucks, had to be optimised.

With Quintiq's SCP integrated software solution, AkzoNobel reduced its costs by €6 million annually, achieving better capacity balancing and improved schedule stability. The company improved capacity utilisation and reduced temporary workers and overtime by 0.5% and SC FTEs by 6 during full productivity. FG inventory dropped by 5% through improved planning and intra-warehouse transfers. While service performance was improved by reducing out-of-stocks and MTO lead time (~1% increase in sales value thus far), most importantly, AkzoNobel reduced SLOB by 20%. They have better servicing and customer care now as another positive result.

Mr. Den Besten concluded by saying that the total picture of utilising SCP solutions means that companies not only end up doing more with less, but even more with more, as they are led down the road to sustainability.

Quintiq, a recognised SCP leader, was established 15 years ago and, due to its success, is growing 40% a year. Mr. Den Besten can be reached via [alfred.den.besten@quintiq.com](mailto:alfred.den.besten@quintiq.com).



**High tech & eco-friendly: what does that mean? Resource efficiency. Fast-moving countries, industries & companies will be the real game winners**

The highest-rated lecture of the Conference was delivered by Ernst Ulrich von Weizsäcker, co-chair of the International Panel on Sustainable Resource Use (founded by UNEP) and co-president of the Club of Rome.

According to the theories and evidence laid out in his co-authored book *Factor Five*, Dr. Weizsäcker explained how we can achieve greater 'factor five' or 80%+ improvements in resource and energy productivity and how to roll them out on a global scale to retool our economic system, massively boost wealth for billions of people around the world and help solve the climate change crises.

### **Present lifestyles, including our way of doing business, are unsustainable**

Today we are witnessing climate disasters/extreme weather, rising sea levels, decreasing populations and species which make up our biodiversity, and dwindling resources. If everyone aims at attaining the kind of wealth that is demonstrated in the U.S., our world population would require the resources of five Earths. Shockingly, only one country exists within the sustainability rectangle: Cuba.

According to the Kuznet Curve, our goal is "to overcome the dirty loo" to end up rich and carbon-free or rich with much less material turnover. It is a huge task. Within the problematic Mikado situation we find ourselves, however, no one country, region or company wants to be the one to make the first move. The reason for this is that until now, GDP has gone hand-in-hand with CO<sub>2</sub> intensity. The same holds for material flows per capita. What Dr. Weizsäcker suggests is aiming for 30% less CO<sub>2</sub> in energy, 65% less CO<sub>2</sub> in wealth and 5% less wealth. This would mean a 5-10-fold increase of renewables, but at the core, it would be a new technological revolution.

### **What can be done?**

We should consider a political decision to raise energy prices artificially. Dr. Weizsäcker said this should be done in parallel with documented efficiency increases, so that average expenses for energy services remain stable. Some low 'lifeline prices' can be established to protect the poor. And for industrial branches that would otherwise collapse or emigrate, a revenue-neutral scheme can create the twin incentive of saving energy and holding jobs. Furthermore, if we want environmental destruction to beat environmental destruction by the Rebound Effect, we also must increase prices of sensitive resources and not merely those of energy.

### **Do not trust markets if you care about the environment**

Market prices systematically tell us lies about long-term availability. Until 2000, energy and mineral resources grew ever less expensive. Since then, they have been rising, but for how long? *Time Magazine* recently featured "The Truth About Oil", in which it said that supplies are rising all the time. Two months ago, Citibank published a paper proudly showing how North America is becoming the new Middle East: It has become a net gas-exporting region.

With 300 million gas consumers, the U.S., Dr. Weizsäcker predicts, will enjoy falling gas and oil prices. Thus nothing will move in the right direction if all is left to the markets. Long-term price elasticity of fuel consumption is very high. As seen in their effect on Germany's significant percentage decrease, eco-taxes can reverse the trend in transport emissions, for example.

### **Japan blossomed during the 15 years of the highest energy prices**

In Japan, where they hardly have any renewables, the government pursued a much more brutal strategy than *Factor Five* is suggesting: From 1975-1990, under fears of being totally dependent upon energy imports, the Japanese let energy prices skyrocket, resulting in mass industrial engagement in high-tech, energy-efficient new methods and products. The digital camera was one of the very profitable technologies which came out of this system.

Thirty years ago, the Swedish government introduced an NO<sub>x</sub> tax with revenue neutrality, in which all the tax proceeds were recycled into the steel industry. After ten years, they were NO<sub>x</sub>-free. Leading chemicals company BASF have the so-called 'Verbund Strategy' of cascading materials and energy through the system, and that has been profitable too.

Developing countries can benefit from gradually increasing domestic-energy pricing, because they cannot afford wastefulness. But interventions should avoid being super-bureaucratic. Let prices steer the market direction, and let engineers work out the details. Ultimately, prices should make the transition profitable.

### **Who will win, and who will lose?**

Dr. Weizsäcker advises creating an alliance of 'winners'. Within countries, industries focussed on high-tech, crafts, science, 'green' practises, railroads, maintenance, culture, high quality and urban renewal will win in *Factor Five*

terms. 'Losers' will include long-distance lorries; aircraft, extractive and heavy industries; developers of urban sprawl; and wasteful consumers.

Geographically speaking, 'winners' will be Europe, East Asia, Oceania and much of Africa and Latin America. These, including developing countries poor in natural resources, amount to about 80% of the world population.

Geographical 'losers' will include the U.S., Canada, Australia and Russia. Also included are commodity-exporting developing countries and those who have never learned the efficient use of energy, such as those with urban sprawl.

### **The first-mover advantage**

In a world of increasingly scarce resources, a 2011 McKinsey Report confirms, countries and companies pioneering efficiency and sufficiency will be the game winners. The lesson learned from the Swedish and Japanese examples is that pioneers need not wait for the slow ones. The focus of the alliance of winners should be on real climate policy, ecological price policies and developing 21<sup>st</sup>-century cities, technologies and habits.

Dr. Weizsäcker encourages the self-adhesive tape industry to think of business opportunities in the direction of *Factor Five*. He is absolutely certain that Afera Member Companies can achieve this and help other companies to do the same. Dr. Weizsäcker can be reached via [ernst@weizsaecker.de](mailto:ernst@weizsaecker.de).

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## **Friday's Programme**

### **Look at tapes as enablers of sustainable solutions**

The first item on Friday morning's agenda: Hermann Onusseit of ONUSSEIT Consulting (D), and FEICA representative to Afera, delivered a lecture entitled "Sustainability: Hype or Our Last Chance?" Is the 'green movement' all about marketing? Yes and no.

#### **'Green-washing'**

The sustainability trend is a major hype in our society today. Whereas the drivers of marketing statements used to be price and performance, today they are very often 'green'. Consumers associate anything that is natural, compostable, recyclable, non-toxic, consumes fewer resources and less energy and/or produces a smaller carbon footprint, with 'going green'. From products such as smart phones, cars, and computers, to online banking even, everyone seems to have jumped on the 'green marketing' bandwagon.

As other presenters had done, Mr. Onusseit detailed our current world environmental problems. In the early 1970s, we reached the world's capacity (ecological footprint) for use of its resources. Since then, these, along with biodiversity, have been depleting at alarming rates. With the standard of living throughout the world increasing, more products are constantly in demand, but we have to find a way to produce them and get them to market with a smaller footprint. As companies and as an industry, we have to do something to better this situation, and we still have time in which to do it.

You will find an increasing number of claims in exhibitions, at conferences and in advertisements of sustainable solutions, 'green products' and 'green systems' attached to products and services, but in the majority of cases, these claims are not factual. Questions about the sustainability of products and processes are increasingly important, yet products containing renewable substances or largely comprised of renewable raw materials, often referred to as 'green products', are being automatically classified as sustainable with minimal justification.

For example, using waterborne adhesion technology to produce laminated packaging films sounds environmentally friendly, but, in fact, it can be more pollutive than alternative technologies because of the high amount of CO<sub>2</sub> generated during the drying cycle, if an artificial drying process is used. This is actually a very unproductive 'green' idea.

**We have the opportunity to enable systems which demonstrate more sustainable behaviour**

As has been decided in the adhesives industry, we in the self-adhesive tape industry should consider tapes, which are often a very small part of the whole product, as enablers of more sustainable solutions. Tapes may not be the key drivers of many finished products, but the tape industry can play a part in enabling a positive sustainable influence in the design, production and delivery processes.

In this industry, as in all other industries, we have to create figures, not feelings. We can only save the Earth if we know how we are going to do it, not simply by believing we can. Furthermore, we have to be better than we have been in the past. Many sustainable energy sources in the market today, such as wind turbines and solar panels, are manufactured using adhesive technology. We have to point ourselves in this direction.

Mr. Onusseit cited an example of an environmentally-productive technology: a new generation of hot melts with lower application temperatures and advantages including lower usage temperatures (130°C vs. 170°C), less energy consumption of up to 70%, less adhesive usage of up to 30% (higher efficiency, less waste, less transportation and easier recycling), lower scrap rate (less waste), increased equipment lifetime (less resource usage) and thinner thermoplastic substrates usage, e.g., for plastic labels, if these hot melts are used for labelling operations.

### **Tapes as enablers of more sustainable solutions**

As most of you know, Afera is pointing itself in the direction of sustainable tape technologies, cuing in on the tides of solid trends in industry. You as parts of the tape value chain are levers for more sustainable solutions. As tape professionals know, there are substantial advantages to be found in tape applications, just as in adhesive applications, for more sustainable solutions.

Furthermore, it is not necessarily the tape itself, but the materials and practises in the entire supply chain, which can create better solutions for the future. This means analysing raw materials, the end-use application and perhaps end-of-life (i.e., can you recycle it, or can you at least burn it and recycle the energy in it?).

### **Manufacturing practises today are still connected to price**

Because of the current ratio of performance to price, materials with which adhesives and tapes are made are mostly synthetic. Of course, natural-based adhesives can be made if enough R&D is thrown behind the exercise. Current oil prices, although consistently increasing, have not increased enough to make pursuing producing natural materials financially attractive. For example, the cost of creating adhesives out of sugar over crude oil is perhaps one hundred times higher.

Currently, we supply ever-increasing demand with unsustainable solutions, and we produce too much waste, which is contributing to an increased incidence of natural disasters through climate change.

### **What will sustainability cost the tape industry?**

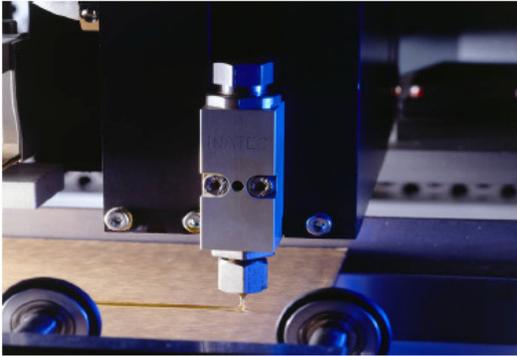
Sustainable products and processes will lead to a minimisation of resource and energy use and a reduction of air and water pollution and solid waste products. Ultimately, these will all save you money by lowering direct costs of materials and energy, indirect costs (such as insurance premiums) and taxes.

We are facing major challenges globally. Resource consumption will accelerate dramatically over the coming decades. No one knows with any certainty what this will mean for our ecosystem. Innovative products and processes will be vital to all efforts to achieve sustainable consumption. There are many ideas in the market. We as professionals associated with the self-adhesive tape value chain need to increase our efficiency, perhaps not 'everything-with-nothing' style, but by being a little cleverer and a little less consumptive.

Adhesives and tapes play a major role in the development of more sustainable products and processes. Ultimately, we have to create more sustainable solutions, while advertising the obvious benefits of tapes, which include effective joining, flexibility, versatility and the qualities of being lightweight and insulative. If modern tapes are less dangerously formulated, they will be less dangerous to environment, worker and consumer. Mr. Onusseit appealed to Afera Members to create these.

Additionally, more environmentally friendly, sustainable tape application techniques will reduce the effort required in pursuing regulatory matters, such as analysing the quantity of adhesives needed, reducing their environmental impact and the amount of waste involved.

## Sustainability in the adhesives industry



### New generation of hot melts with lower application temperature:

- Lower usage temperature (130°C vs. 170°C)
- Less energy consumption of up to 70 %
- Less adhesive usage of up to 30 %: higher efficiency, less waste, less transportation, easier recycling
- Lower scrap rate: less waste
- Increased equipment lifetime: less resource usage
- Usages of thinner thermoplastic substrates

## Bio films: How sustainable does our industry want to be?

The following lecture covering sustainability and innovation in the packaging and labels industry was delivered by Ruud Wigman, market manager of Labels EMEA for Innovia Films (NL). Mr. Wigman's aim was to illustrate the drivers for sustainability from a brand-owner perspective and how bio-plastics can play a role as a renewable energy source for packaging, labels and tapes. Many believe that their businesses are innovative, but it could well be that innovations from outside the industry have a huge effect on your business position. Out-of-the-box thinking will be key to survival.

### Changing consumer behaviour

The growing world population and imbalance in social well-being and resource use is generating turmoil. The effects of El Niño and La Niña, causing hurricanes, floods, draughts and fires, have impacted the world's food harvests and human safety. Major end-users are very much aware of climate change, its causes and its effects.

Major brand-owners are therefore analysing their product footprints, as well as the behaviour footprint of the consumers using their products. Substantial initiatives have been created to reduce and reuse materials on a production level, but consumer behaviour is more difficult to influence. What can packaging in a broad sense do to contribute to a behaviour change on the consumer level?

### Bio-plastics

Bio-plastics can contribute to sustainable solutions in terms of using renewable resources over finite resources. Depending on applications, there are options using polymers that are 'bio-based, but not bio-degradable' (e.g., based on bio-ethanol), 'bio-based and bio-degradable' (e.g., PLA, starch-based materials, cellulose materials, etc.) or

‘materials from synthetic polymers and polyvinyl alcohol sources that are bio-degradable.’ Bio-polymers are increasingly used, such as in the automotive, packaging, textiles, catering-ware and electronics industries.

Using bio-polymers ticks many hot-topic/buzzword boxes: They are a renewable resource, contribute to a ‘low-carbon economy’ and exhibit excellent functionality. In principle, ‘the circle of life’ is followed when using bio-polymers from the start to end-of-life of operations. At the ‘start of life’, materials can be sourced from certified sources and contain a high degree of renewable ingredients. In terms of performance, there has been a steep curve of improvements, varying from thermally stable products, barrier properties, clarity and process ability.

In a perfect world, the end-of-life options are usually based on reuse, recycle or biodegrade. The end-of-life stage, however, often produces waste that pollutes the environment to such an extent that there are enormous, floating islands of rubbish in the oceans, such as the so-called seventh continent.

The end-of-life stage for waste is complicated. It is not possible to separate packaging materials from food waste, for example, so recycling of flexible packaging materials is not possible. Only plastic bottles can be recycled or reused. The contaminated packaging material is burned or ends up as landfill. If packaging material were compostable, then food waste could be used as a source for organic recovery, creating bio-ethanol and reducing CO<sub>2</sub> emissions to boot. For every ton of organic waste that is recovered or processed, anaerobic digestion reduces 1.5 tons of CO<sub>2</sub> emissions and creates 100 litres of bio fuel.

### **Don’t be the company that misses the boat**

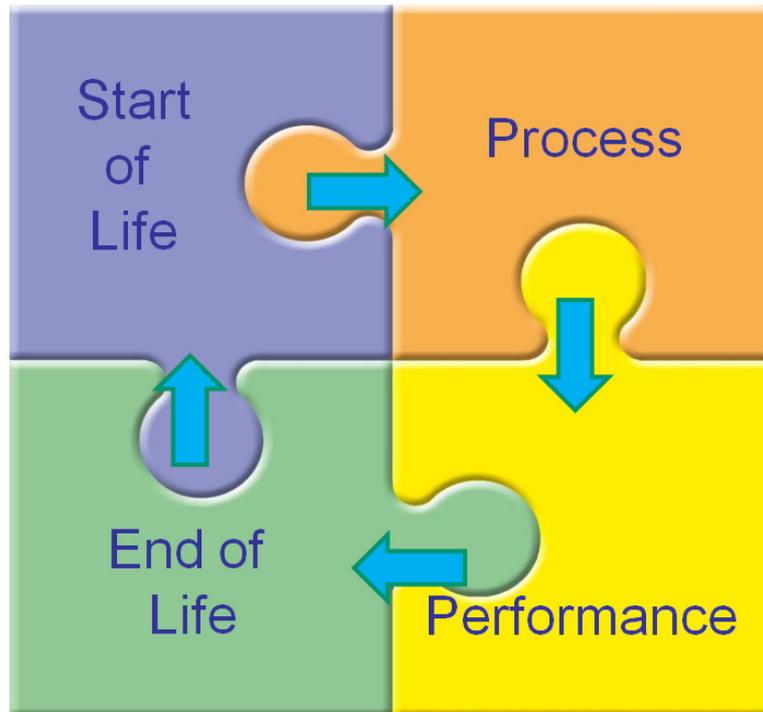
The use of bio-plastics is still in its infancy compared with that of conventional polymers. It will take time to grow the efficiencies in production and to reduce costs, but this will happen. Not adopting these innovative materials can cause a sudden push-back in consumer acceptance as other producers unexpectedly take the lead.

As an illustration of how some innovations can affect our lives, the introduction of the iPhone a few years ago revolutionised the way people communicated. This new technology changed the landscape of mobile phone producers, forcing them to change their businesses or even disappear.

An interesting innovation is the conductive inks, which could have a significant effect on standard packaging materials. Print electronics can make packaging ‘smart’, and the next step is even within reach: Print electronics in combination with printed solar technology can make packaging a standalone interactive product. As a result, standard packaging materials could lose ground. The same principle may apply to the use of conventional polymers from finite sources: The world will have no other option but to switch to sustainable sources for tapes, packaging and labels, as some product industries are already experiencing.

Mr. Wigman can be reached via [ruud.wigman@innoviafilms.com](mailto:ruud.wigman@innoviafilms.com).

## The four pieces of the Sustainable Packaging Jigsaw



Promoting the Interests of the Self Adhesive Tape Industry

### What does sustainability mean for a pulp producer in Canada?

Following a midmorning break, Michael Bradley, director of sustainable enterprise at Canfor Pulp L.P. (CDN), delivered a presentation on his North American company's approach to and experience with sustainability issues.

In 1987, the UN World Commission on Environment and Development referred to sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." A simple definition with profound consequences, this intergenerational view of managing ecosystem services is widely quoted whenever discussions around sustainability take place.

A recent Dow Jones news release stated, "The concept of sustainability has long been attractive to investors because of its aim to increase long-term shareholder value. ...These sustainability companies...will outpace their competitors and be tomorrow's winners."

#### LCAs

In terms of sustainable enterprise at Canfor Pulp, various factors have shaped their 'sustainability thinking', such as the performance of life cycle assessments (LCAs), which they have found to be very helpful in understanding what the holistic 'environmental shadow' of the company's products look like. On the other hand, Mr. Bradley said, the limitations of LCAs are that they are complex and don't handle land use, as well as social and temporal issues, well. Nonetheless, Canfor Pulp have now completed three LCAs and have collaborated with others on several others, learning something new with each one.

Industrial Ecology (IE) is the study of material and energy flows through industrial systems. The name comes from the idea that we should use natural systems as an analogy in understanding how to design sustainable industrial solutions.

### **Influence of the ENGO community**

Environmental, non-governmental organisations (ENGOS) should be taken into account, as they have been a force for positive change in the forest sector. The campaign/collaborate/solution model that we have seen recently has worked. It can be almost dialectic in nature. Where change is needed, ENGOS can be a powerful inside/outside force, and they are not confined by policy. When solutions are being worked on, there are very real incentives for all parties to remain engaged. Durable or sustainable solutions require broad-based support, and ENGOS are an essential component of this.

### **Influence of the customer**

We monitor our dialogue with our customers and their customers. We have learned important lessons from many, and we have taught some lessons to a few. The process is ongoing: new customers, new lessons. The key question we have learned to ask: "Will my product be good for my customers and their customers, or not?" This question applies to all dimensions of the product—not just its technical properties, but safety, value, environmental properties.

### **What are the main sustainability challenges we need to focus on today?**

One of the most important is overuse of the Earth's precious resources, such as deforestation of coastal temperate rainforests. 25% of what remains globally is found in British Columbia. Initiatives such as our Joint Solutions Project, started in 2001, put emphasis on solving environmental challenges among all relevant stakeholders.

### **Growing interest in water footprints**

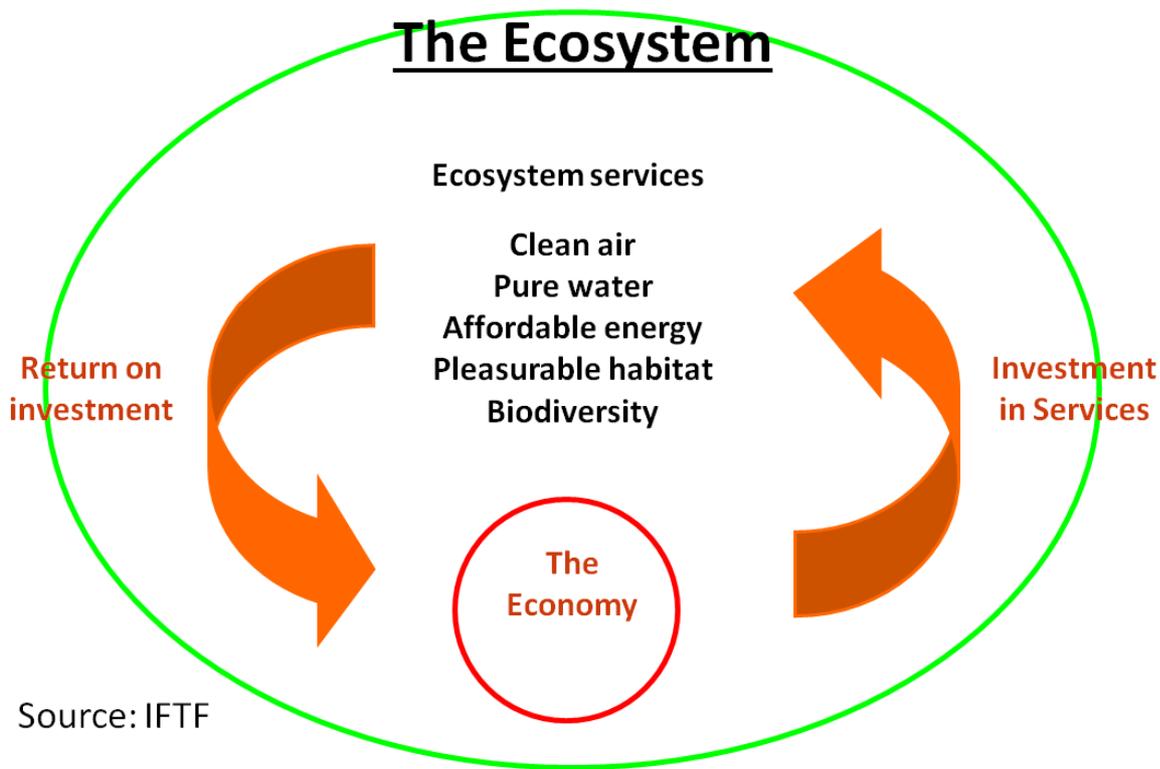
Water use and availability is a growing concern surrounding many industries. A fundamental requirement of pulp and paper production, water is heavily used in that it is 'borrowed', 'reused' and 'returned' (at a rate of 98%). It is also key in forest regions, which are often the watersheds for communities, controlling run-off, flooding, purity, etc.

R&D departments, in Canfor Pulp's case the Innovation Centre - Design for Environment (DfE), works with customers to find ways to enhance their products and use our pulps more efficiently. Where practical, the statistical significance of trial predictions (lab or mill) is improved by using experimental design techniques. Recently, Canfor Pulp has been combining LCA data with traditional product development techniques.

Engaging in local environmental issues which stem from industry, such as the PG Low Odour Project and the Nechako White Sturgeon Recovery Initiative, is necessary and productive. Canfor Pulp is also engaged in environmental best practises, seeking and encouraging forest certification by third parties. Canfor Pulp issued its first 'sustainable product declaration' in 1997. Provided to all customers, these are life-cycle based, third-party audited and annually updated.

Mr. Bradley can be reached via [michael.bradley@canforpulp.com](mailto:michael.bradley@canforpulp.com).

# Sustainable Development Ecosystem



## Secondary fibres: A new fibre source for tapes?

The next session of the Conference was a well-received presentation delivered by Holger Baumgartner, head of the German Zellcheming and director operations at Neenah Gessner GmbH (D), which has found ways to develop and produce environmentally friendlier paper products successfully. Mr. Baumgartner described how Neenah Gessner found a variety of fibre types and selected one source to feed its new 'green line'. The eco-balance of the recycled fibres have enabled GESSNER® Flexpack and GESSNER® Greenmask to deliver required 'green' advantages to appreciative customer groups.

### **A co-existence of both fresh and recycled fibres is the ideal combination**

In speaking about selected recycled or recovered fibres, it might sound as if we don't want or need fresh, virgin pulp fibres anymore, explained Mr. Baumgartner. Far from that, we desperately depend on a constant fresh fibre feed so that we can keep up with our physical properties down the supply chain. A co-existence of both fresh and recycled fibres is the ideal combination. Close relationships in developmental partnerships allow us to understand scientifically what our fibres deliver and how we can treat and mix them in our processes, so we are able to fulfil customer demands.

As a company, there are a few main drivers for recycling leftover, or waste, products: mandatory regulations, monetary reasons (cost savings) and responsibilities expressed in our environmental strategy and philosophy. But now we have gone a step further in allocating a new fibre sources for our tape production supply. We screen certain industrial processes in which Northern Bleached Soft Kraft Pulp (NBSK) grades are in use. These processes reject leftover and waste volumes which were interesting for us.

### **Recycling fibres in Germany**

European recycling levels are among the highest in the world. It makes clear sense to require recycling as the population density in Central Europe is so high. Germany, for example, has 85 million people (one-third that of the U.S. population) living in an area of the size of Texas, which is 3% of the total size of the U.S. This makes recycling in terms of collecting and separating easier and more cost effective.

With a total production of 25 million tons of paper and cardboard and a recycling level of 73%, of which 61% (approximately 15 million tons) are reused as fibre resources, there is a valuable constant delivery of certain selected, high-quality fibres available.

### **Why do we recycle?**

The eco-balance of recycled fibre versus paper directly from wood:

- 2-6 times less water usage
- Total energy demand is 3-4 times lower
- Higher global natural forest and biodiversity protection
- Elimination of energy waste for new fibre transportation worldwide
- Re-usage of a functional fibre is more environmentally responsible
- Recycling is a moral obligation in all developed societies and countries.

In order to be able to purchase the same recycled fibre quality, we use the well-established European List of Standard Grades of Recovered Paper and Board, introduced by CEPI (the Confederation of the European Pulp and Paper Industry) in Brussels. In Category 03.04, Tear White Shavings, we were able to find our required raw material. In comparing virgin pulp with selected recycled fibres, laboratory results show no significant differences.

### **The raw paper of tapes**

The fibre morphology directly relates to the final physical performance of our products. Length, width and surface of the fibre lead to more or less drainage, formation and run-ability on the paper machine. Furthermore, it results in important properties of our paper, such as elongation, tear strength (Elmendorf) and thickness (calliper). In comparing the electron microscopic pictures of both fibres, there are no significant deficiencies of the recycled fibre over the original fresh virgin pulp. There may be signs of a 'primary life', but none which would disqualify it for our purpose.

### **Two new Neenah Gessner tape products: GESSNER®Flexpack and GESSNER®Greenmask**

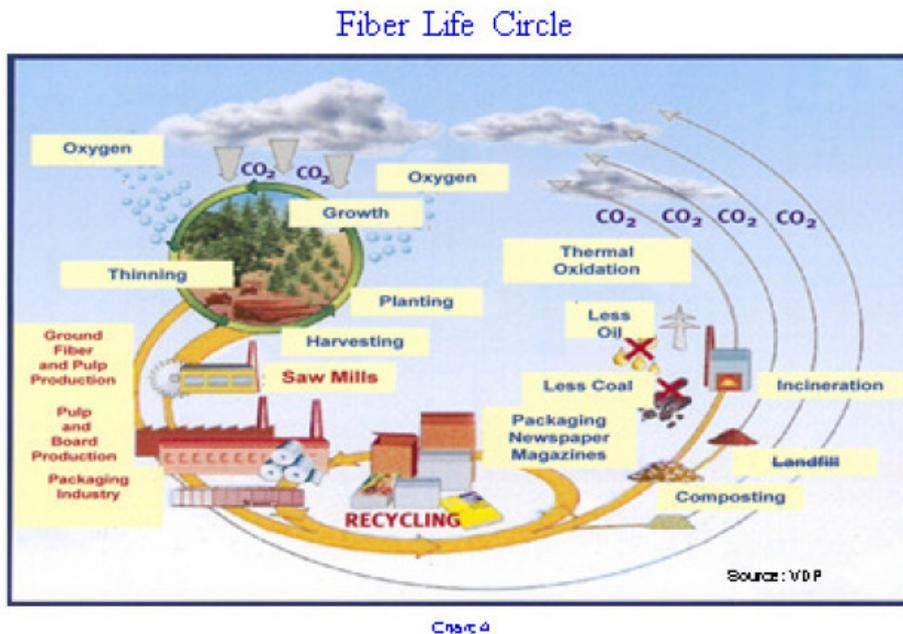
100% recycled, Gessner®Flexpack packaging tape offers you a solution that allows you to promote the 'green' recycling idea fully within your markets and customers. Even though we use the fibres twice, all laboratory tests show a nearly identical product to one made from fresh fibres.

GESSNER®Greenmask consumer and industrial tape with 50% recycled fibre content is fully competitive. Slightly less thickness (calliper) and tensile force dry are compensated for by a higher tear index (Elmendorf). We offer a high-performing tape with a clear message to your customers who appreciate a more responsible, environmentally friendlier product.

In conclusion, there is an existing supply chain for selected recycled fibres. Fresh virgin pulp fibres mix perfectly with recycled fibres, although physical properties are slightly different for recycled grades. A policy of utilising selected recycled fibres provides a good fit for your environmental company philosophy and clear facts for environmentally cautious customers. Not only are you already using a fully sustainable product with paper, but you use it for multiple cycles, reducing your company's environmental impact.

Mr. Baumgartner can be reached via [h.baumgartner@neenah.de](mailto:h.baumgartner@neenah.de).

## Chart 4



What do we compare? What makes the difference?

- Onetime fiber usage **vs.** re-use and recycling of selected fibers

## Avery Dennison's Greenprint programme

Josh Dunn, sustainability director of materials businesses at Avery Dennison (USA), discussed his company's LCA-based tool Greenprint, which was designed to accelerate customer collaboration on sustainable products and solutions. It communicates a product's environmental impact across six categories to help you and your customers make more informed decisions.

### "Forging a path forward"

Avery Dennison presented itself as "positioned to inspire more sustainable solutions." Its marketing communications describe the company as "powered by experience in materials science, process technology and inventory logistics" and "uniquely positioned to enhance the sustainability of products, brands and their supply chains." To the company, Mr. Dunn related, sustainable development means designing our products, processes and services with environmental and societal concerns in mind.

### "Smart companies now treat sustainability as innovation's new frontier"

Sustainability at Avery Dennison is about creating shared value for our customers, their value chains and the communities we serve. "To do so, we are embracing the collaboration that is inherent in sustainability," says president and CEO Dean Scarborough. "Our company is one point in a value chain, and our impact extends from one end to another. We are working with upstream and downstream partners to understand our impact and develop materials and processes with them that can improve the footprint of the total value chain."

Having begun its sustainability-themed activities in 2007, Avery Dennison launched its Greenprint programme in 2010 and released its first GRI-based (Global Reporting Initiative) sustainability report in 2011, marking the first full disclosure of our environmental performance, explained Mr. Dunn. The company is collaborating with suppliers and customers to lower impacts in terms of materials innovation, sustainable sourcing and LCA-based design.

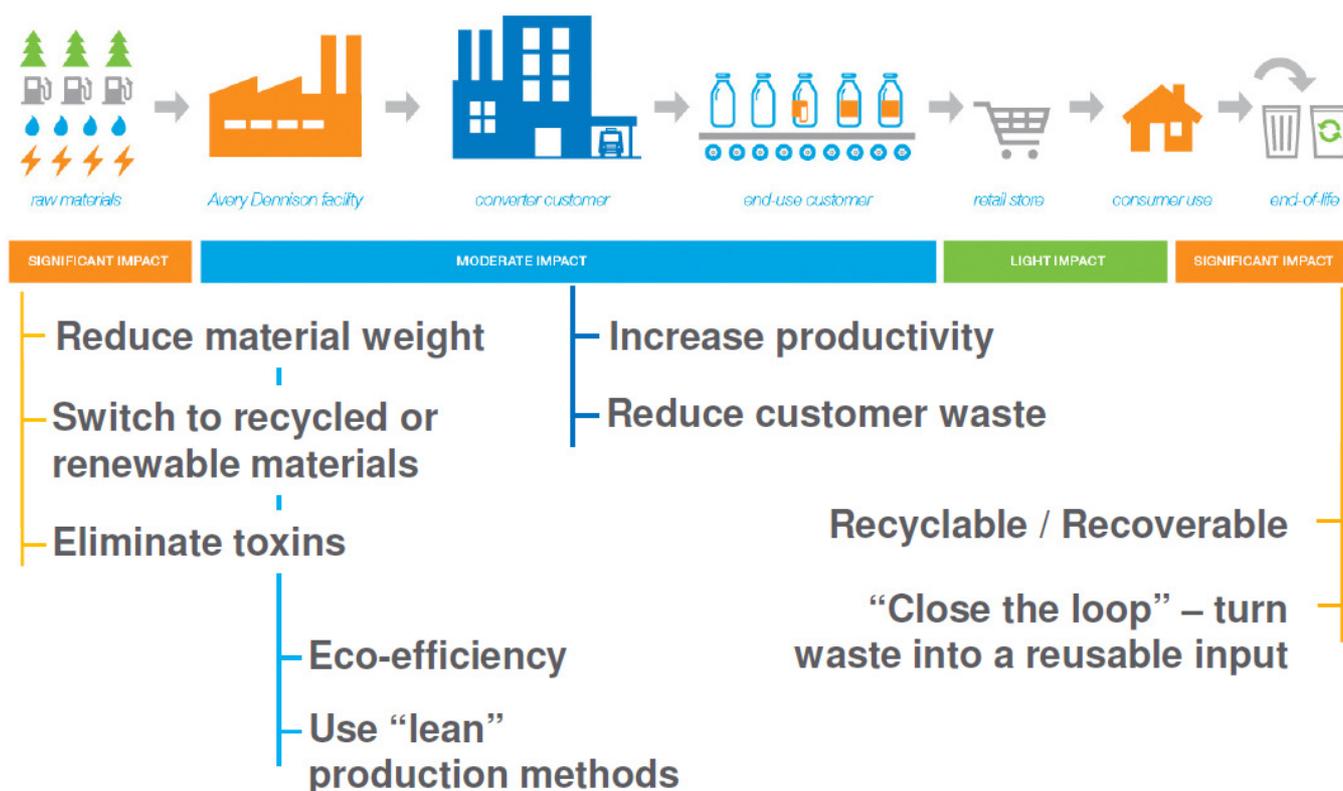
Based on three pillars, Avery Dennison’s sustainability programme focuses on industry leadership in sustainable solutions, responsibly sourced materials and energy, energy-efficient facilities, zero waste to landfill, safe and fair labour practises and investment in our global communities. Waste management, which can be described using the inverted-pyramid allegory, is focussed first and foremost on reduction and recycling.

### LCA thinking & Avery Dennison™ Greenprint

LCA can measure aspects of environmental impact of products at various stages throughout the value chain, including raw materials, AD facility, converter customer, end-use customer, retail store, consumer use and end-of-life. The Greenprint tool makes the impact of sustainability measures quantifiable.

Mr. Dunn can be reached via [josh.dunn@averydennison.com](mailto:josh.dunn@averydennison.com).

## Here are examples of what we can measure with LCA



## Corporate social responsibility and sustainable development to drive innovation

The last session of the Conference was a popular presentation delivered by Eric Pass, director of corporate strategy and new business and a board member at Nitto Europe N.V. (B), as well as Vice-Chairman of Afera’s Marketing Committee. Mr. Pass discussed how, with a new world order evolving, his company is moving away from the current linear business model “we take, we make and we waste” toward “reuse, remake and protect”.

A multi-product, multi-technology and multi-market company, Nitto Denko is looking to extend its global business activities into the emerging markets of the Middle East, Africa, Russia and Eastern Europe. The company’s logo embodies its philosophy: Rise to the challenge of recognising a point of change and embrace it with a flexible attitude, making use of our personnel and technologies.

Mr. Pass commended the previous speaker, Mr. Dunn, on Avery Dennison™ Greenprint and suggested that the company licence out its impressive sustainability programme to all the companies falling within the tape industry value chain. This would create the industry standard for environmental best practises.

### **Reacting to the ‘game change’**

Disruptions in our environment, society, economy, technologies, demographics and regional power are creating a new world order. In mapping out impact scenarios related to these disruptions, keeping in mind its high value placed on corporate social responsibility, Nitto Denko has developed a focus on sustainability concentrated in three areas: Non-fossil-based and/or recycled raw materials; more sustainable manufacturing processes; and functionalities such as easily-recyclable, energy-reducing and carbon-footprint minimising.

Nitto Denko’s approach toward sustainability is completely different. It is not simply about correcting what we are doing wrong but more about how we can avoid unsustainable practises already at the beginning of the design process of our products and also at the design phase of the products of our customers.

We also need to change the way consumers function, from “we buy, we use, we dump” to “we buy, we use, we return.” Consumers should be stimulated to turn in their old equipment for recycling. Unfortunately, currently less than 10% of old mobile phones, a huge source of raw materials and precious metals, are actually returned.

### **REACH 2012**

In 2008, the company defined a vision called REACH 2012 in which it becomes a clean, ‘green’ and healthy company. In terms of clean: clean products, corporate governance and clean working space; ‘green’: reduction in energy use, ecological products, less waste and care for the environment; and healthy: healthy employees, healthy growth and healthy work/life balance. Nitto Denko’s target was to achieve 20% of its turnover through 12 Green Value products. Although the company did not reach its goal, due to the diversion of the economic crisis and other factors, it has taken important initial steps in this complicated area, and it is currently working on its next five-year plan towards 2017-2018.

### **PSA tape technologies can help to make the world a little more sustainable**

Nitto Denko looks for materials and processes which make the lowest possible impact on the planet and that add product functionalities to facilitate sustainable usage and end-of-life. In everything we do nowadays, we try to apply this ‘cradle-to-cradle’ approach. At our purchasing and sourcing departments, we try to apply these procurement principles. In Nitto Denko’s production, we apply ‘green manufacturing’: reduction of CO<sub>2</sub> emissions, waste and energy consumption. We look for alternatives for road transportation and for optimising packaging. We are currently looking into adding ‘green’ features to our products, and we also think together with our customers on how to facilitate end-of-life.

### **‘Green products’**

Nitto Denko has developed a low-emission tape for ‘green compartments’ in cars. To complement the light-weight functionality of cars, we have also developed NVH (noise, vibration and harshness) materials. Thirdly, we have developed some prototypes of PSA tapes based upon bio-based materials.

Another sustainable development is a double-coated tape, which bonds products strongly during its lifetime and then lowers and finally disappears in adhesive strength at end-of-life so that the components of the product can be disassembled by recycling companies into cleaner waste streams: metals, plastics, glass, etc. Nitto Denko believes that this type of de-bonding technology, if built into eco-design articles and products, can facilitate recycling, thereby contributing to the sustainable functionalities of PSA tapes.

As a spinoff from our research on bio-based materials, we have set up a separate technology centre in Lausanne, Switzerland, where we will focus on new materials in the new emerging areas of life-sciences.

### **Sustainability is a positive business driver**

Nitto Denko’s approach to sustainability drives innovation, in terms of the development of functionalities of its products and the processes that we have internally and externally. Lastly, its approach to sustainability drives how its personnel work together internally and externally with customers and suppliers.

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## Conclusion: Approach sustainability gradually but steadily

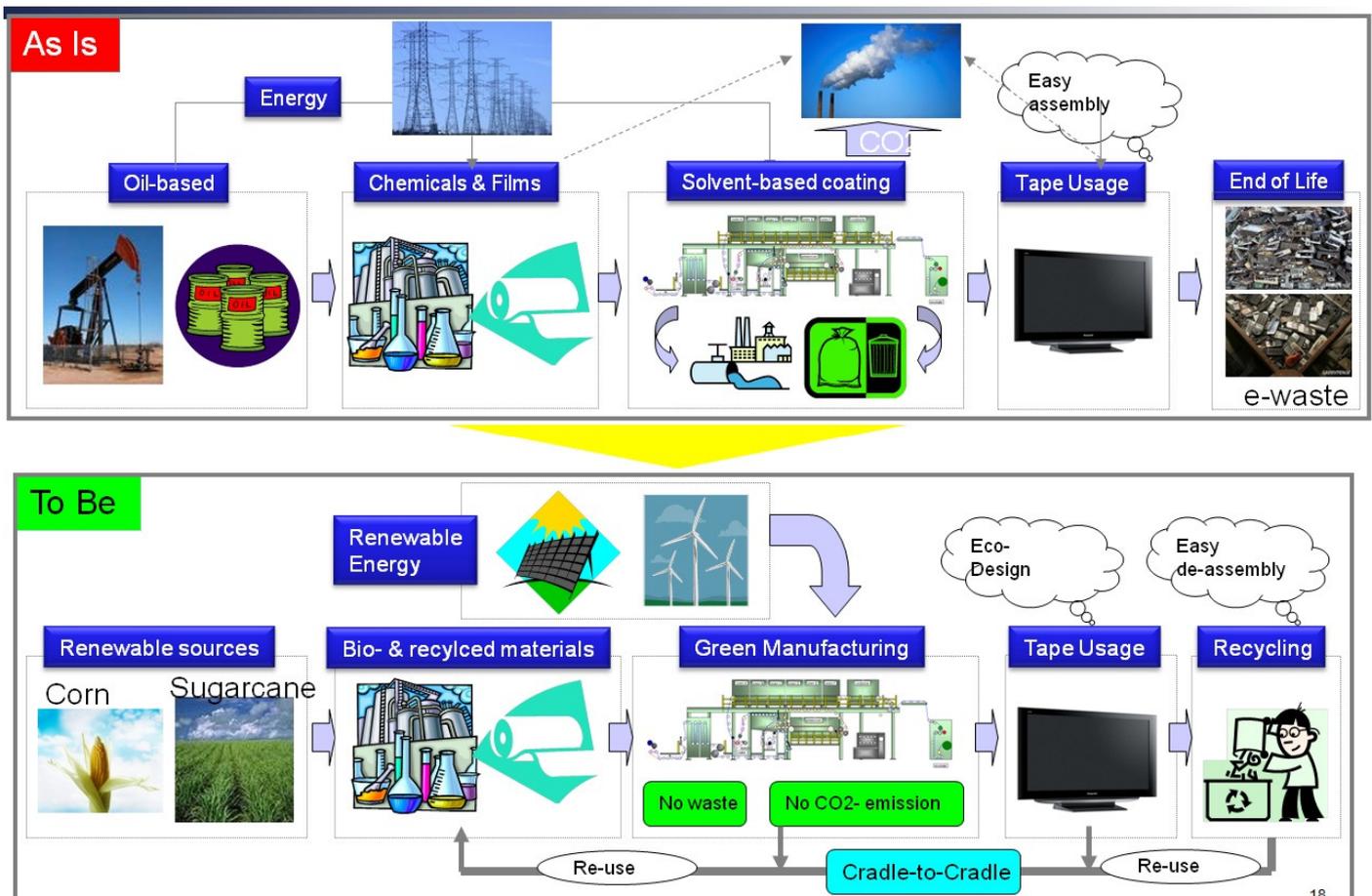
Mr. Pass concluded with some remarks on the process of approaching sustainability of companies and the tape industry as a whole. If we think we can change what we've been doing incorrectly for 200 years within just a few years, this is naive.

We, as tape professionals and businesses and the industry, need to take steps one-by-one with the understanding of what is feasible and not feasible within one or more business cycles. Eventually, we will reach a tipping point at which a lot of knowhow and technology will come together, when you can solve many problems which could not be figured out any earlier.

There are still countless questions which cannot be answered, but that doesn't stop me from looking for ways in which we can gradually improve our level of sustainability. The point is, if we look at sustainability using the same criteria we have done in the past, we will never make any progress, because we will always find reasons why we cannot move forward.

Mr. Pass can be reached via [eric\\_pass@nittoeur.com](mailto:eric_pass@nittoeur.com).

## A Sustainable Future for PSA Tapes



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## See sustainability as a useful instrument

Mr. Rambusch added in closing that sustainability is not only a buzzword and an important environmental issue to be addressed by today's companies operating in the tape value chain, it is actually a productive instrument with which to shape our businesses in making better products and creating more profit.

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## Slide Presentations & Additional Info.

The proceedings of the Conference lectures and a detailed event programme, as well as this article, can be found at [www.afera.com](http://www.afera.com).

## Annual Conference 2013 in Sicily

Hosted by Afera's Italy region of Membership, Afera's 56<sup>th</sup> Annual Conference is set to take place from 1-4 October 2013 at the Atahotel Capotaormina in Taormina, Sicily.