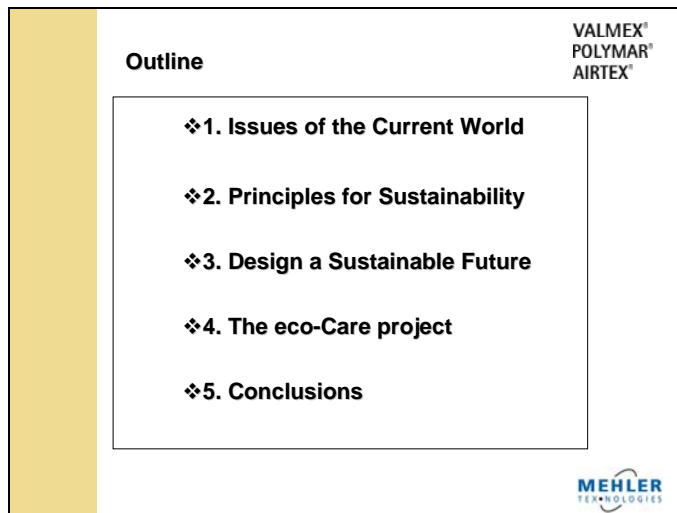


Folie 1



Folie 2



(Greetings).... my presentation is based on the analysis of Sustainable design and environmental impact of recyclable membrane materials. That's the overview points


Folie 3

❖1. Issues of the Current World

- High energy consumption
- Deforestation
- Habitat destruction
- Soil problems
- Water management problems
- Over-hunting
- Overpopulation

→ Environmental degradation due to mismanagement of natural resources.

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Our times are to be consider the logical consequences of wrong handled civilization progress. The natural resources are been fully exhausted by inappropriate and unconsidered usage, which leads to following problematics...


Folie 4

❖Indicatives consequences

- Mass extinction
- Energy shortage
- Build up of toxic chemicals, pollution
- More potent destructive technologies
- Alienation and social breakdown
- Global climate change

→ the risk of a global rather than a local collapse increase.

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As consequences to this inconsiderate consumption and the human severity in modeling anything for the own current use with less care of the consequences, global problems are arising...


Folie 5

❖ **Critical points overview**

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- Overpopulation
- Overconsumption
- Resources depletion
- Wastes and pollution

→ Degenerative pattern generated by egocentric living style and money-driving economy



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The slide features a yellow vertical bar on the left. The main content is enclosed in a black border. At the top right, the text 'VALMEX® POLYMAR® AIRTEX®' is displayed. Below this, a list of four critical points is shown. A line connects the list to a cartoon illustration of a man in a suit pushing a cart with a large dollar sign on it. The man is looking back over his shoulder. The background of the cartoon shows a sun and a moon. At the bottom right of the slide is the 'MEHLER TECHNOLOGIES' logo.

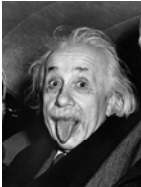
As finally we can see every day, the modern society is running in a no exit way, where the problems generated by ourselves are to be considered a destructive and irreversible heritage to next generations. Problems like the here listed points are to be considered generated by wrong way of thinking.

Folie 6

❖ **..for the future**

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"We cannot solve problems using the same thinking that created them."
- Albert Einstein



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The slide features a yellow vertical bar on the left. The main content is enclosed in a black border. At the top right, the text 'VALMEX® POLYMAR® AIRTEX®' is displayed. Below this, a quote by Albert Einstein is presented in italics. Underneath the quote is a small black and white portrait of Albert Einstein with his tongue sticking out. At the bottom right of the slide is the 'MEHLER TECHNOLOGIES' logo.

So therefore for the future.....

Folie 7

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❖ ..different thinking is required

Today's Economy vs. Tomorrow's Eco-Economy

<ul style="list-style-type: none"> • Competitive, hierachy • Degenerative • Money-based, market forces • Favours maximum production • Carbon, fossil fuel based energy system • Pollutes the environment by toxic chemicals <p>→ Unsustainable</p>	<ul style="list-style-type: none"> • Co-operative, network • Regenerative • Respects principles of ecology • Favours optimum production • Renewable energies and reduced energy systems • Reevaluate the environment by re-usable materials <p>→ Sustainable</p>
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....a different way of thinking is required!

Folie 8

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❖ 2. Principles for Sustainability

Sustainability, in a broad sense, is the capacity to endure in balance with the environment.

Support a Sustainable Development means:
Respecting ecological balance, avoiding depleting natural resources, replacing waste with efficient recycling and protecting the climate

Since the acceptance of the concept of **Sustainable Development** (world conferences of Rio de Janeiro 1992 and others) it is stated that **Sustainable Development** is based on three main pillars, namely **environment, economy and society**.

Bearable, Equitable and Viable crossing aspects deliver finally full **sustainable** solutions.

The guideline argument:
"meet the needs of the present without compromising the ability of future generations to meet their own needs".

Folie 9

❖Design a Sustainable future

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Design for Sustainability means in general:



Designing products to improve the quality of life today, without compromising the quality of life of tomorrow.
In order to design sustainable products and services.....
innovation, creativity and new ideas are required by product manufacturers and designers.

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Design for Sustainability aims to take all global and regional socio-economic concerns into account in products and services, meeting the needs of society now and in the future moving from a product to a service orientated system.

Folie 10

❖Design a Sustainable future

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Design for Sustainability in general aims:
“to take all global and regional socio-economic concerns into account in products and services, meeting the needs of society now and in the future, moving from a product to a service oriented system.”



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As aim of Design for Sustainability is to aspire to a better society, now and in the future, innovation, creativity and new ideas are required by product and end user designers, and are key to success.

Example of moving from a Product to a Service way of thinking with respect to Sustainability:

During the past many products are been designed for economical use without to take in consideration the consequences generated during production or at end of service life. They were used in the walls and floors to act as both insulation and heat resistance. Asbestos panels were often put in place near furnaces and stoves, prime locations should a fire occur. And while asbestos surely helped many people in this primary use, it damage many other people health. In our time, asbestos is off the market, and is only found in homes and buildings that have not been retrofitted. Prior to 1970, asbestos panels could be found in many homes under several use. Remove and recycling of those materials generates high pollution and heavy environmental impact.





Products like this are designated to execute they function but cannot be considerate as service to the sustainable needs.

Folie 11

Examples of different way of designing

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Product oriented design vs. Service oriented design

The nuclear energy industry takes care of energy production costs and amount of energy production.
At today there is no one 100% safer way of produce and store nuclear energy and all related wastage materials.
This is a product orientated think and cannot be considered sustainable.




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Is of our days the debate about new nuclear plants construction. The agencies, the politicians, the technical and the industries are all focusing their interest about the usage of this plants and the produced energy. There are not enough discussions about development of huge wastages quantities or about recycling of those...this is not the right way of thinking.

Folie 12

Examples of different way of designing

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The old incandescence lamp.
Low production cost but high energy consumption.
Can be recycled

Energy saving and long life lamp. High production cost but low energy consumption.
Difficult to be recycled

Energy saving and long life LED lamp. Medium production cost and low energy consumption.
Can be recycled

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As energy costs and environmental concerns have risen the industry was rightly thinking in re-design illumination products. From the old bulb lamp the market cross to energy saving lamps which contain mercury, a substance with high enviromental impact. On the other side, those lamps are saving energy and therefore helps the environment in another way.
More business operators and homeowners are finding that it makes sense to switch to an LED light source which are non containing damaging gases and saves energy as well.

Folie 13

Importance of "Design for Sustainability"

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On a global scale current design and use of products are seen to hinder Sustainability as designers ironically increasing focus on disposables. Therefore:

4 R's regarding design for sustainability:
 Repair → Refine → Redesign → Rethink

Repair: Accept responsibility for the consequences of design decisions upon human well-being, the viability of natural systems and their right to co-exist.

Refine: Eliminate the concept of waste. Evaluate and optimize the full life-cycle of products and processes, to approach the state of natural systems, in which there is no waste.

Redesign: Understand the limitations of design. No human creation lasts forever and unlimited use does not solve all problems. Treat nature as a model and mentor, not as an inconvenience to be evaded or controlled.

Rethink: Rely on natural energy flows. Human designs should, like the living world, derive their creative forces from perpetual solar income. Incorporate this energy efficiently and safely for responsible use.

The premises of Design for Sustainability is the fact that the way products are designed can have a major effect on Sustainable Development. On a global scale current design of products are seen to hinder Sustainable Development. A new way of thinking is necessary.

Folie 14

❖ **3. Design a Sustainable future**

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Design for Light-weight materials and structures

- Focuses on optimising the type, volume and weight of materials so that less energy is used during production, transport and life cycle.
- Use products and solutions deliberately designed to generate more benefits with less efforts in order to deliver a quality and balanced result.
- Integrate materials offering combined acceptable performances instead of many single-performing materials

For example, in architecture:

- Use tension-balanced support instead of using thick-walled or weight reinforced components
- Reduce the volume in transportation: Consider foldable or stackable designs and final product assembly at the retail location or by the end-user

Designers are ironically constantly increasing focus on a disposable world of materials, also in tensile architecture, adding to the 'mountains' of waste products derivate from non-recyclable materials, instead of generating ideas on recycling systems which could help in decrease the already overflowing landfills.

Product designers and the related industry have a responsibility not only to the end user, but also to the people who are employed in the manufacture of these products.

Folie 15

Design for Light-weight materials and structures

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Tensile Architecture compared to classical construction materials involves use of a smaller amount of materials/mass and is mostly prefabricated executed = less execution time




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Folie 16

Design for Light-weight materials and structures


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Tensile architecture compared to classical architecture solutions is recreating natural light condition generating positive, safer life ambiances



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Folie 17

	<p>Design for less emissions & reduction of energy consumption</p> <ul style="list-style-type: none"> • Application of design that will lead to lower energy consumption in general • Use products realized with low energy consumption at production and manufacture • Use of more efficient use of consumables origin materials • Use materials containing approved and traceable additives and chemicals • Design to minimize the use of auxiliary materials/systems to reduce emissions during a project's life span., e.g., pneumatic support • Minimize maintenance or service life necessary additional emission measures 	<p>VALMEX® POLYMAR® AIRTEX®</p> <p style="text-align: right;"></p>
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It is widely accepted that the majority of negative impacts from products arise from its in-use period. The majority of energy consumed by electrical appliances arise from its in-use phase of its lifecycle.

For ex. in architecture pneumatic systems, like the Allianz Arena.

The arena facade is constructed of 2,874 ETFE-foil air panels that are kept inflated with dry air to a differential pressure of 400Pa. The foil has a thickness of 0.2 mm. Each panel can be independently lit with white, red, or blue light. The intention is to light the panels at each game with the colors of the respective home team, or white if the home team is Germany. The **Daily** energy consumption for the lights equates the **yearly** energy consumption of a four-person-family.

Additionally, foldable materials are been installed under the roof to drawn during games to provide protection from the sun light.

Similarly, washing machines will generally use hundred times the energy at the 'in-use' phase (over a ten year use cycle), that it takes for their manufacture.

Folie 18

Design for less emissions
& reduction of energy consumption


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Ex.1 Environment high impacting composite materials like PTFE-Glass:

PTFE cannot be processed like other thermoplastics by extrusion or injection moulding due to the high melt viscosity. It can only be formed by compression moulding and sintering at 350° – 400°C, and manufactured at similar higher temperatures.
Due to the inalterable fusion between coating and support materials, PTFE-Glass membranes cannot be easily recycled.

Ex.2 Environment high impacting systems like inflated elements:

Auxiliary pneumatical systems are necessary in case of air supported permanent tensile architecture solutions. This is generating additional emissions during a project's life span.
The energy consumption for the air aggregate for a 90tsd m³ pneumatical roof equates the yearly energy consumption of a middle standing industry. (approx. 25tsd,-€/year)



Only Glass fibers can withstand the processing temperatures of PTFE. Other synthetic fibres decompose under these conditions.

To weld Glass-based membranes a pressure of 2.2 tons at 7-bar compressed-air supply is necessary. Temperature approx. 380/420°.


Folie 19

Design for Recyclability

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Product design can make a significant contribution to recyclability.

- Use materials which can be easily and optimally recycled nearly to the dismantling place.
- Select materials that are in mutually compatible groups, e.g. for plastics – ABS, PES, PVC, ecc.
- To aid recycling, avoid materials which are difficult to be re-used as compound or be separate itself such as laminates and fibreglass reinforced.
- Choose viable, feasible and economic recycling systems, avoiding high volume packaging and reducing to minimum loadings of wastage materials.
- Avoid use of non documented, non conforming materials
- Avoid polluting elements such as stickers, bounding strips or similar that could interfere with recycling processes.



As well as using recycled materials for products, the products, or their parts, must in turn be able to be recycled at their end-of-life, otherwise the products will have a large negative impact from ending up on the scrapheap. There are several recycling systems more or less adaptable or usefull to the kind of products used. PTFE fabrics as well as other fibreglass reinforced material cannot be easily recycled.

Folie 20

Investing in recycling-able products

The huge potential impact of PVC products can be shown easily: With only 0,5 % of the cost of PVC-products one can compensate the entire Greenhouse Gas effect (100%!) caused by them.

Investing this small amount of money into environmental improvements allows the creation of products which are still very competitive whilst achieving a much lower environmental impact than their alternatives.

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Recycling systems needs to be affordable and possibly available nearly the product end life area. System providing isolated collection points and long ways of transportation, even if technically valid, they will not contribute largely and directly to a real improvement of recycling tasks.

Ex. if for recycling of a bottle of beer peoples needs to walk 10 kilometres then probably the bottle will be leaved somewhere along the way. Is proven that recycling systems are working where affordable for the people and this make sense, as transporting of wastage generate anytime additional wastage (transportation, contamination, risks, ecc.)

Folie 21

In general

Tensile architecture compared to classical architecture solutions shows lower environment impact: Economic, ecological and therefore socially compatible

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Folie 22

❖4. The Eco-Care project

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Our commitment to environmental responsibility and sustainability

The **MEHLER** *eco-care* Project



The responsible way in which the company deals with energy and resources, its use of environmentally sustainable materials and its activities related to the recycling of coated textiles have been bundled by Mehler Texnologies under one all embracing label.

Folie 23

Sustainability begin with selected raw materials
The European REACH directive

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REACH stands for **Registration, Evaluation and Authorisation of Chemicals**. This new EU directive centralises and simplifies chemicals legislation across Europe and has been in force since 1st June 2007.

The objective of REACH is to improve knowledge of the dangers and risks that can emanate from chemicals. The companies affected by REACH are producers, importers and users of chemical substances. The intent is transfers to the companies greater responsibility for dealing safely with their products.

We confirm that **our goods are conform to the REACH guidelines**.





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Folie 24



Reliable and effective partners

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We believe that the preservation of the environment is much more than "waste management" as may be the case of the sole recycling tasks.
Mehler Technologies, as one of the large coating company in the world, producing more than 50Mil.m² fabric/years and is participating actively to sustainable activities as partner of Vinyl 2010. This commitment covers the entire lifecycle of PVC and PVC products and represents for Mehler Technologies a set of guidelines for acting in a sustainable manner.



PARTNER FOR SUSTAINABILITY



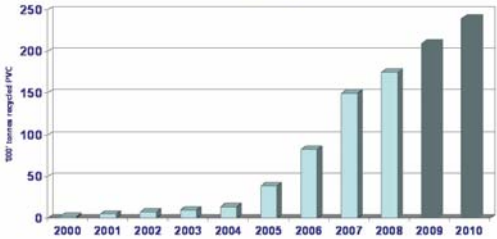
Folie 25

The Vinyl 2010 associates main commitment

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- Recycling **200.000 tons** of post consumer PVC waste by 2010 (in addition to established recycling volumes at 2000 and excluding regulated waste streams)
- Replacement lead stabilisers 100 % by 2015
- Stop using cadmium stabilisers in 2001 (REACH regulations)

Evolution of recycling Volumes



Year	Recycling Volume (1000 tonnes)
2000	~5
2001	~10
2002	~15
2003	~20
2004	~25
2005	~40
2006	~80
2007	~150
2008	~180
2009	~210
2010	~240

Source: Vinyl 2010 Report yearly report 08



As partner of Vinyl 2010, Mehler is contributing in reaching the main objective in collecting within 10 years activity more than 200 tsd tons of PVC wastage

Folie 26

Overview of recycling systems results in EU

PROJECT	Type of PVC post consumer waste	Tonnage recycled in 2007	Tonnage recycled in 2008
EPcoat (incl. only for 2008 Recycling)	Coated fabrics	2,609*	11,323*
EPFLOOR	Flooring	2,054*	2,524*
EPRA (incl. Recycling)	Window profile waste & profile related waste	56,046	79,877
ESWA - ROOFCOLLECT and Recycling)	Flexible PVC	20,454*	19,333* tonnes which consist of:
ESWA - ROOFCOLLECT	Roofing and waterproofing membranes		954
Recycling)	Flexible PVC applications		18,379
TEPPFA (incl. Recycling)	Pipes & fittings	21,236	22,555
EPRA (incl. Recycling and CPFA)	Rigid PVC film	2,135	4,352
Recycling (incl. Window-Fittings)	Cables	44,929	54,986
TOTAL		149,463	194,950

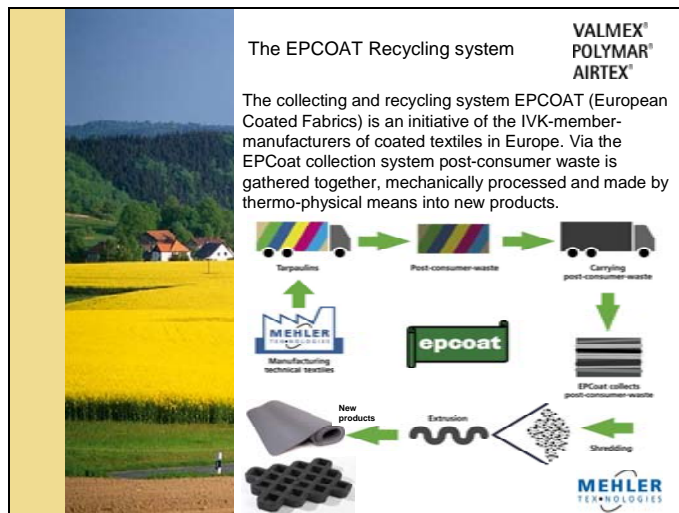
Source: Vinyl 2010 Report yearly report 09

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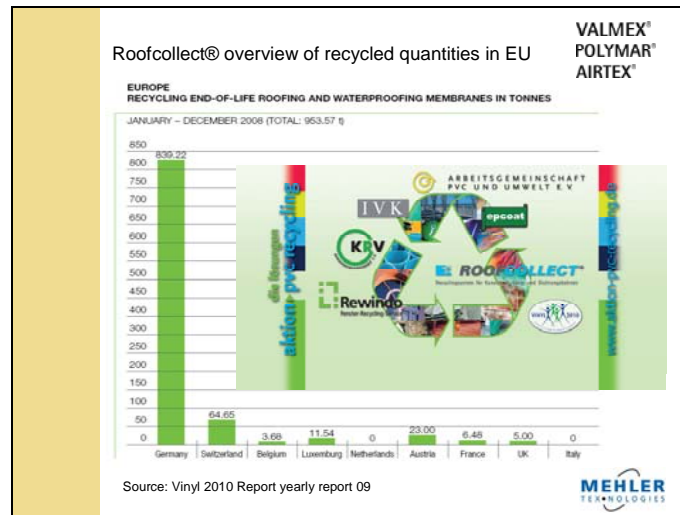
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PVC can be collected and recycled in several manner. Not all recycling systems are appropriate to handle all PVC products existing in the world. Mehler is supporting the Epcoat system, adaptable for recycling of coated fabrics. In year 2008 the system is well increasing the amount of fabric recycled and is been integrated to a much more wastage handling system for such a waste products.

Folie 27



Folie 28



Epcoat is part of other systems including impermeabilisation membranes made out of PES-PVC. Those systems are growing up in Germany and contributes to the large amount of recycled fabric products in EU

Folie 29

In-house recycling

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Waste created during paste production and residual paste from coating operations is processed and made into products again

→ **eco-tarpaulin**

The leftover paste is also used to coat textile remnants


→ **different applications**

Each production site recycles exclusively the residual materials generated there. Transport costs and unnecessary gas emissions are thus avoided.

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Mehler Texnologies aims to recycle as high a percentage as possible of waste caused by the company's production operations. This waste consists on the one hand of base materials, such as textiles and pastes, and on the other of residual waste from finished products.

Folie 30



Investing in a secure future

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Mehler Texnologies has invested millions of Euros into the purification of waste gases

→ **reducing CO₂**

Circulation flows to utilise thermal energy created during the production process

→ **less gas and electricity**


All components due to the European REACH directive

→ **free of DOP, monomers and other components not permitted in Europe**

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Over recent years, Mehler Texnologies has invested millions of euros into the purification of waste gases in order to continually reduce CO₂ emissions. Circulation flows have also been developed to utilize thermal energy created during the production process and thus to reduce the consumption of gas and electricity.

Folie 31



Far-sighted actions open up new horizons

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Investing in improved equipment at production facilities

→ **energy efficient manufacturing**
→ **avoiding production waste**

Keeping a very close eye on the environment and resources

→ **recycled materials for packaging**

Establishing local storage facilities

→ **no long-distance transportation**
→ **less exhaust fumes and pollution**

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As well as using ecologically harmless raw materials and continuing to develop sustainable production methods, Mehler Texnologies is also investing in improved equipment at its production facilities. Energy efficient manufacturing and the fine-tuning of systems to avoid production waste are further steps being taken to ensure production of reliable and innovative quality products.

Folie 32

❖5. Conclusions

- Our main industry responsibility is to be good parents to our next generations. It will need support from all of us to grow and prosper.
- By designing and use products we should evaluates the environmental + ecological impact during all the stages of a product's life cycle
- It becomes obvious that the greatest influence on the life cycle energy usage *is at the design and at the end life stage of a product*


To continue to be an alternative, the tensile industry needs principles that:

- is grounded in sustainable development
- can incorporate hard targets and timetables
 - can provide traceable and recyclable materials
- can provide a sustainable and coherent long term solution
- include the potential for a truly global approach

Remeber....

*"We cannot solve problems using the same thinking way that created them."
Albert Einstein*


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Folie 33

Mehler Texnologies around the world

THANKS FOR YOUR ATTENTION



● Sales company

● Sales office

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